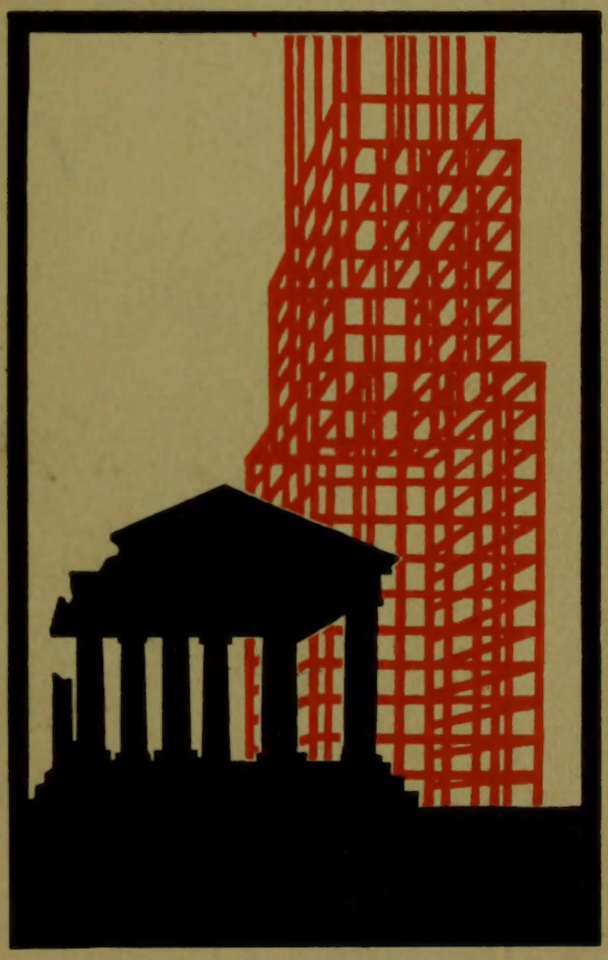
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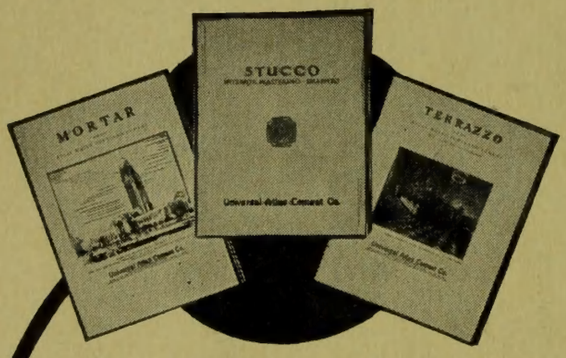
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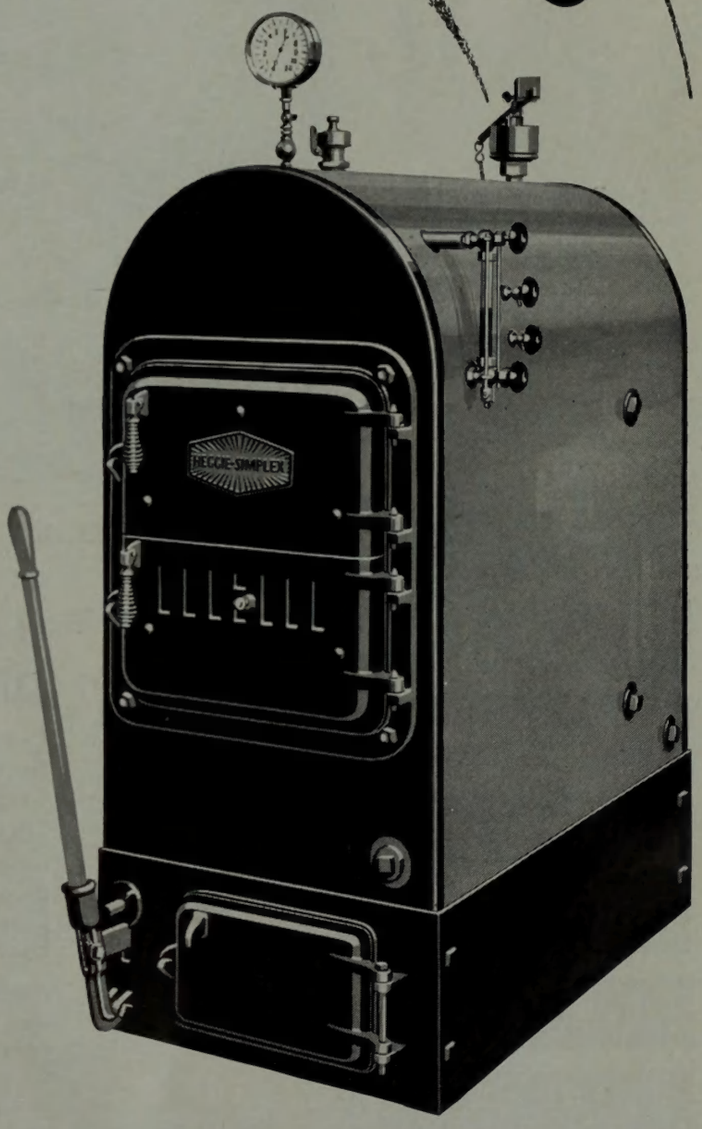
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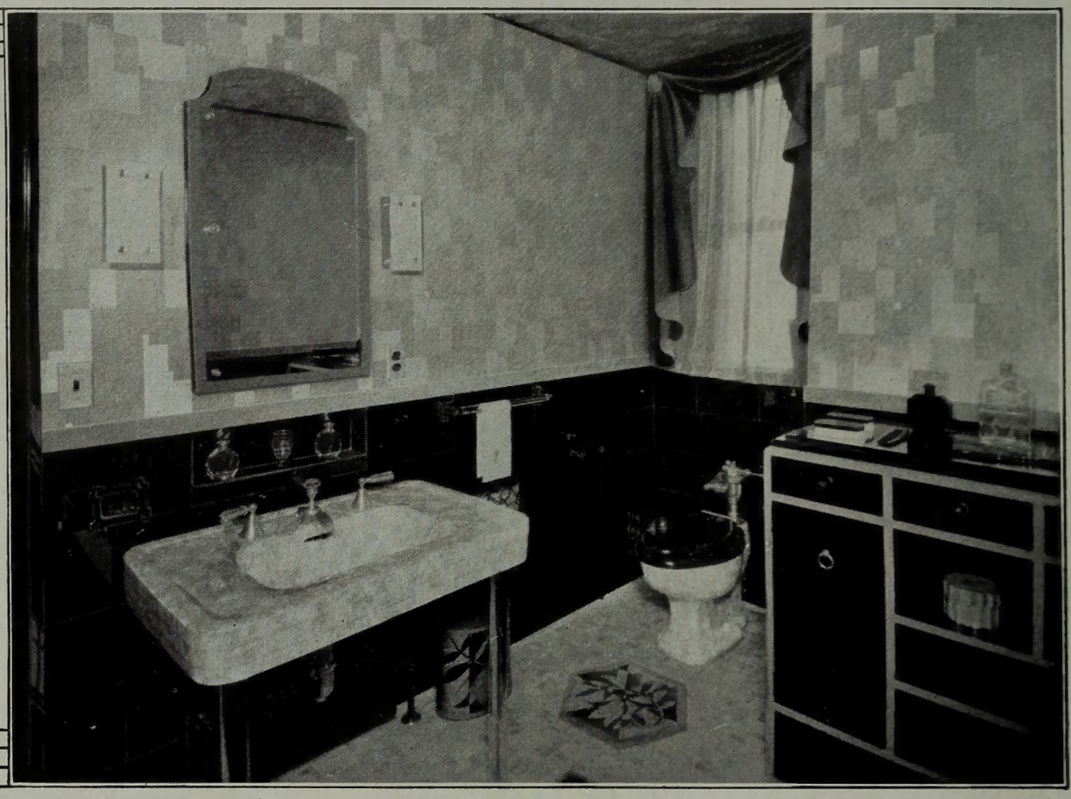
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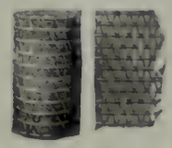
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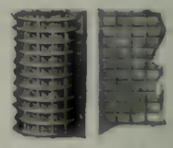
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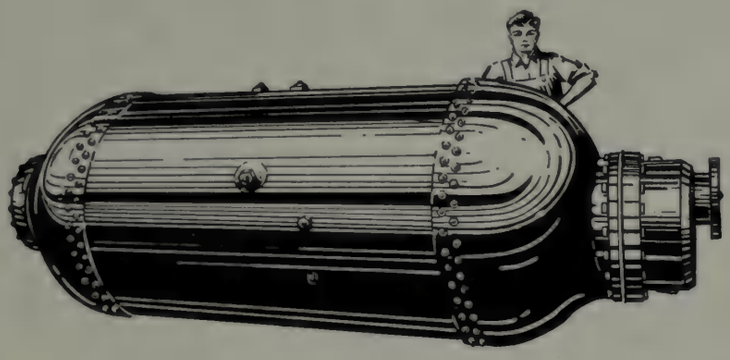
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THE Dahlquist line of copper hot water units gives you everything that your clients may require, from the largest heavy copper boiler for industrial purposes to the smallest range boiler for the modest dwelling. Furthermore Dahlquist quality stands supreme with thirty years' reputation for giving the additional value that insures long life, trouble-free service and satisfied customers. It is this extra value which has built the Dahlquist Manufacturing Company from a small one-man business to America's largest manufacturer of copper boilers.



GAS UNIT
Range Boiler

Dahlquist Copper Superaquatherm Automatic Storage Systems Patented

Are the latest contribution of science to the home hot water supply. They are entirely automatic, use gas or electricity, are fully insulated to avoid heat radiation, and embodying the patented aquatherm principle of water circulation, effect a remarkable economy in fuel bills. In spite of all their advantages, Dahlquist's enormous production results in the lowest prices.

Write for full information.



AUTOMATIC
ELECTRIC UNIT



KEROSENE UNIT
Range Boiler

Dahlquist Mfg. Co.

30 West 3rd Street — So. Boston, Mass., U. S. A.

Specify

THORP DOORS

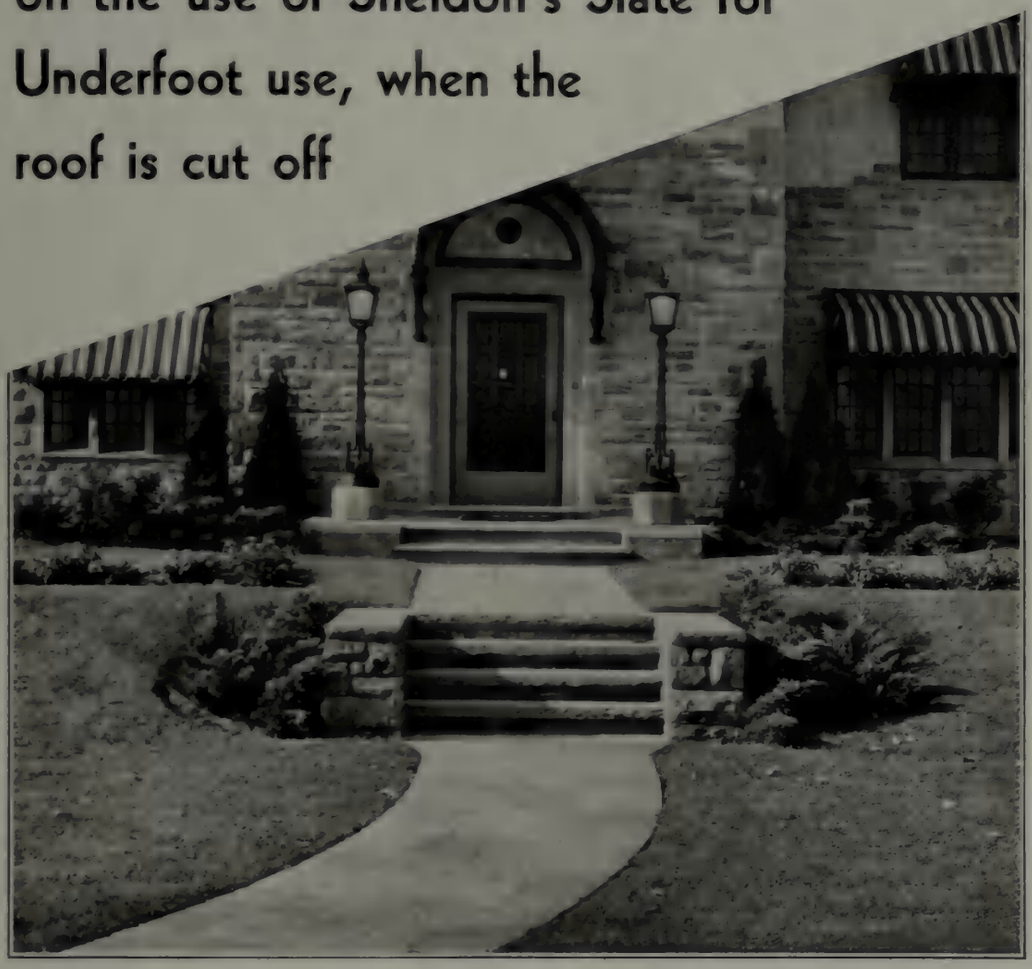


A building's street entrance either brings to a focus the dignity and substance of the whole structure—or it does not. Realizing its importance, Foeller, Schober and Berners, the architects of the new City Center Building at Green Bay, Wisconsin, chose Thorp to execute the entrance following their designs. The grill and push bars are wrought bronze, in a forceful and interesting design. The doors are bronze. Proved methods of construction, early developed and always used by Thorp, insure their giving many years of faultless service.

THORP FIRE PROOF DOOR COMPANY
MINNEAPOLIS . . . MINNESOTA

You get a Better Slant

on the use of Sheldon's Slate for Underfoot use, when the roof is cut off



The Architect handling good projects can not forget that Sheldon's is "The Roof of Eternal Beauty."

But the many other uses of Sheldon's Colored Slates are not so spontaneously thought of; and so we have deliberately mutilated the photograph of the C. M. Day residence, Jackson, Michigan (Beckett & Akitt, Detroit, Architects) to call attention more forcibly to the walk. Imagine its colors: Sheldon's light and dark unfading greens, weathering greens and grays, clear and mottled purples, with an intelligent scattering of brown pheasants and Arabian reds.

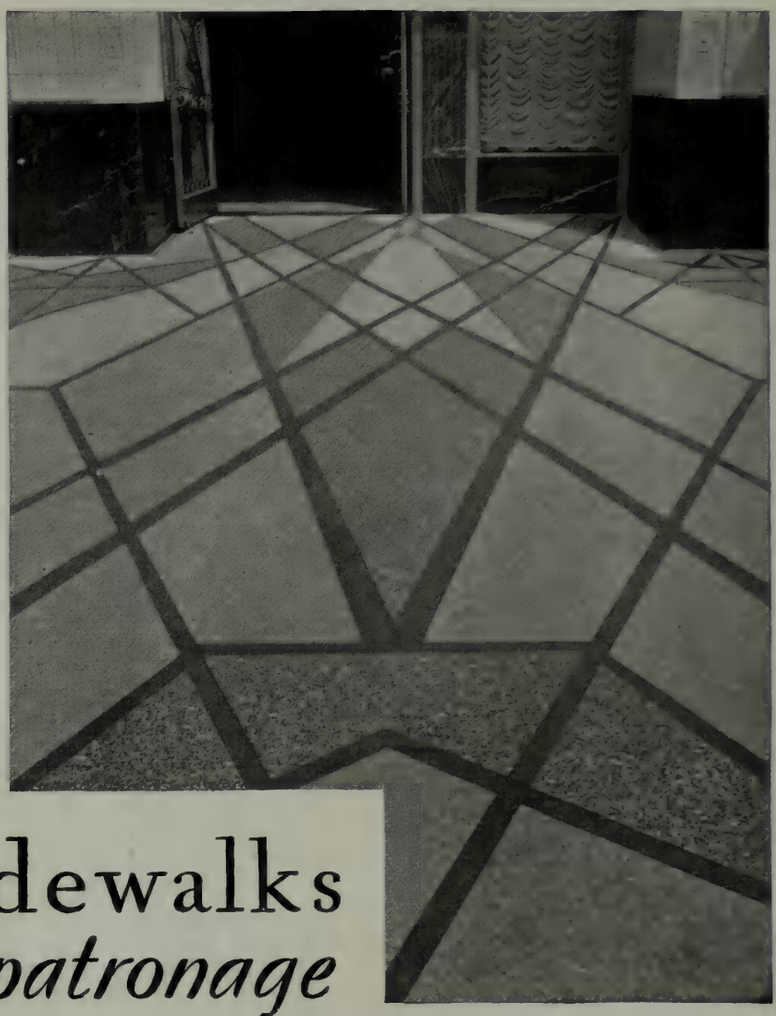
Note particularly that Sheldon's slates, in these colors, were used also, in random rectangular and semi-irregular patterns, for the front, side, and rear terraces, the stag-room hearth, the upper garden walk, the pergola floor, and the floor and coping of the basin.

Look in Sweet's for four Sheldon Slate Roofs in natural colors; but in any event permit us to help you utilize these slates for other purposes to which they can contribute unusual, distinctive beauty.

F.C. SHELDON SLATE CO.

GENERAL OFFICES · GRANVILLE · N.Y.

· BRANCHES IN PRINCIPAL CITIES ·



Portland cement concrete sidewalks surrounding the Wilshire Professional Building, Los Angeles. Arthur E. Harvey, Los Angeles, Architect.

Sidewalks *which invite patronage*

Sidewalks are playing a new role. They are helping business set the stage for sales, by providing an attractive approach to the shops they border. The patterns illustrated on this page were carried out in terrazzo, one of the specially finished forms of portland cement concrete. The result is really an extension of the lobby floors to the pedestrian area outside — an invitation to enter the building and its shops.

Each day concrete assumes new importance in the realm of business. Its fire-safety affords protection alike to lives and property. It contributes a substantial and enduring beauty to the architecture of smart shop and towering department store. It helps create favorable comment. In building and surroundings, *concrete sets a magnificent stage for sales!*



Sidewalk patterns—new and different—may be produced at somewhat less expense than the fine terrazzo here pictured, by mixing suitable mineral colors in the concrete.

PORTLAND CEMENT *Association*

Concrete for Permanence and Firesafety

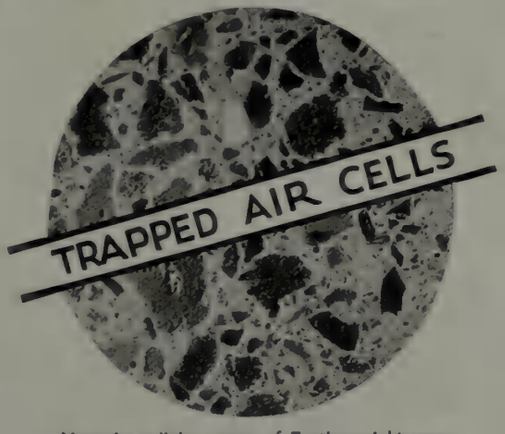
33 WEST GRAND AVENUE
CHICAGO

The 10 POUND Precast Roof Deck

is made of HAYDITE CONCRETE—the material whose unique structure of trapped air cells provides strong, light, insulating roof slabs which go on the same light steel frame that carries other roofs.

Featherweight slabs produce the lowest cost permanent roof available today—they are fireproof and free of all maintenance expense. Millions of square feet are in use by the country's leading industrials, railroads and public buildings. "Catalog and Roof Standards" on request.

Featherweight Concrete INSULATING ROOF SLABS



Note the cellular nature of Featherweight concrete which makes it light and insulating, yet with concrete's standard strength and density.

Made, Laid and Guaranteed by

FEDERAL CEMENT TILE COMPANY

608 South Dearborn Street Chicago

FOR OVER A QUARTER CENTURY

In Cleveland's Great

CLEVELAND UNION TERMINAL BUILDINGS
Cleveland, Ohio

Architects:
Graham, Anderson, Probst & White,
Chicago, Ill.

General Contractors:
Lundoff — Bicknell Company, Cleveland, Ohio
John Gill & Sons, Cleveland, Ohio
Aronberg-Fried Company, Cleveland, Ohio

Chief Engineer:
H. D. Jouett, Cleveland, Ohio



Among the materials used in this construction were the following products from Subsidiary Manufacturing Companies of the United States Steel Corporation:

American Bridge Company
Fabricated Structural Steel Work for buildings and viaducts.

American Sheet and Tin Plate Co.
Apollo Galvanized Sheets.

American Steel & Wire Company
Wire Rope, Wire Fabric Reinforcement, Nails, Rail Bonds, Wire Strand, Electrical Wires and Cables.

Carnegie Steel Company
Carnegie Beams, Structural Materials, Rails.

Cyclone Fence Company
Copper-Steel Chain Link Fence and Pipe Railing.

Illinois Steel Company
Structural Shapes, Plates and Bars.

The Lorain Steel Company
Cast Steel Foundation Plates.

National Tube Company
National Pipe and Conduit.

Universal Atlas Cement Company
Universal and Atlas Cement.
Atlas White Portland Cement

Terminal Project

The magnificent Cleveland Terminal—one of the outstanding construction projects of recent years—affords an excellent opportunity to visualize the complete service offered by one of America's leading industrial organizations. From the massive foundations to the pinnacle of the central tower, the products of the principal Subsidiary Manufacturing Companies of the United States Steel Corporation serve in some important capacity. Not only the main buildings and foundations, but the ramps, viaducts, paving, tracks, conduits, approaches and enclosures—all required the extensive use of Steel and Concrete.

Just as a close cooperation and organization of working forces has been necessary to erect this splendid project, so a closely coordinated organization, working hand in hand in mutual giving and taking of practical experience and manufacturing ability, has furnished products essential to its construction. Future years of long life and satisfactory service will demonstrate the many benefits to be derived from using, wherever possible, products from one source of supply, where the factor of quality and service has been the keynote of production.

Principal Subsidiary Manufacturing Companies of the UNITED STATES STEEL CORPORATION

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
ILLINOIS STEEL COMPANY
MINNESOTA STEEL COMPANY
NATIONAL TUBE COMPANY
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TENNESSEE COAL, IRON & R. R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors–United States Steel Products Co., Columbia Department: San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributors*–United States Steel Products Co., New York City





UNFADING SLATE ASSOCIATION
OF VERMONT, INCORPORATED

Fair Haven, Vt. 193...

This is to certify that.

THE CONTENTS of CAR No.

LOADED ON 193.....

CONSIST OF

ROOFING SLATES OF UNFADING COLOR

AS LISTED ON REVERSE SIDE OF THIS CERTIFICATE

..... SECRETARY

Above—reproduction of the certificate issued by the Unfading Slate Association of Vermont, Inc., which is your guarantee that the shipment is 100% unfading slate.

ART FOR THE ROOF

It is our desire to aid art and architecture, towards the fulfillment of which we offer products from quarries with the quality of distinction. For roofs with design of simple dignity we suggest soft unfading green, unfading mottled green and purple, or both in combination. These rich and mellow combinations are permanent in coloring. Architects feeling a responsibility to their clients may, with no additional costs for this quality, specify and demand a certificate issued by the Unfading Slate Association of Vermont, Inc., and be assured of permanent color. The certificate is your guarantee.

Represented in Sweet's Architectural Catalogues, Volume B, Page 1737

O'BRIEN BROTHERS SLATE COMPANY, Inc.

Established 1901

Architect's Service Department, Architect's Building, 101 Park Avenue, New York
Telephone ASHland 3651

Granville, N. Y. Quarries: Pawlet, Vt.

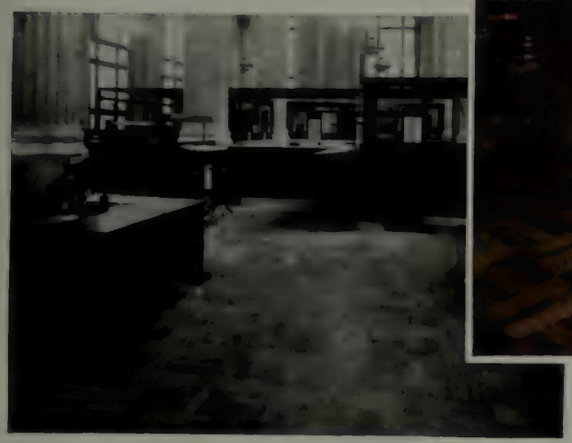
*CELLized wood floor blocks

for homes, apartment hotels, dining and ball rooms, clubs, churches, hospitals, showrooms, banks, schools and public buildings generally.



*CELLized Oak blocks in the Nurses' residence, Hospital for Consumptives, Mt. Dennis, Ontario, Can. Architect, Raymond Collinge—Flooring Contractor, R. Laidlaw Lumber Co., Toronto.

The strong color contrasts in this floor are obtainable in "lower" grade blocks only



11¼" Quartered White Oak blocks in the Bank of Commerce, Memphis, Tenn. Hanker and Cairns, Architects. Superior Floor and Screen Co., Floor Contractors.



The Wetherby-Kayser Shoe Co. at Pasadena, California. 9" Oak blocks. A. B. Slack, owner.

STYLE in floors, not only for homes, but for all types of interiors where wood floors have not heretofore been considered desirable or economical, is possible through the economy and versatility of the *CELLized unit wood block. Beauty, durability, and inexpensive upkeep are combined with low cost.

NEW— Architects are invited to visit the *CELLized office display in Memphis. Combinations of woods, both squares and rectangles, are installed in floors, walls and ceilings. These offices in actual use illustrate the wide application of unit blocks under service conditions.

Condensed Specification
FLOORING—Shall be *CELLized Blocks, laid according to *CELLized specifications over subfloor, by a Licensed Floor Contractor. Delivery of the *CELLized Oak Flooring Inc. 5 year guarantee by the contractor will be required upon completion of the job.

OAK	BEECH	MAPLE	RED GUM	WALNUT	PHILIPPINE MAHOGANY	MAPLE*
Rectangular blocks in two sizes, 6" x 12" and 6¾" x 13½" Square blocks, 13-16" thickness in the following sizes:						
6¼ in.	6¼ in.	6¼ in.	*for walls*	6¼ in.	6¼ in.	*also in 1 1-16" thickness in the following sizes:*
7½ in.	7½ in.	8 in.	*and ceilings*			
9 in.	9 in.	9 in.	6¼ in.	9 in.	9 in.	
10½ in.		9¼ in. 10 in.	9 in.			
11¼ in.	11¼ in.	11¼ in.	11¼ in.	11¼ in.	11¼ in.	6¼ in.
12 in.	12 in.	12 in. 13 in.				9 in.

*For industrial floors, maple blocks are also fabricated 1 5-16" thick; several sizes.



LICENSED *CELLized Oak Flooring INC. MEMPHIS TENNESSEE FLOORING CONTRACTOR

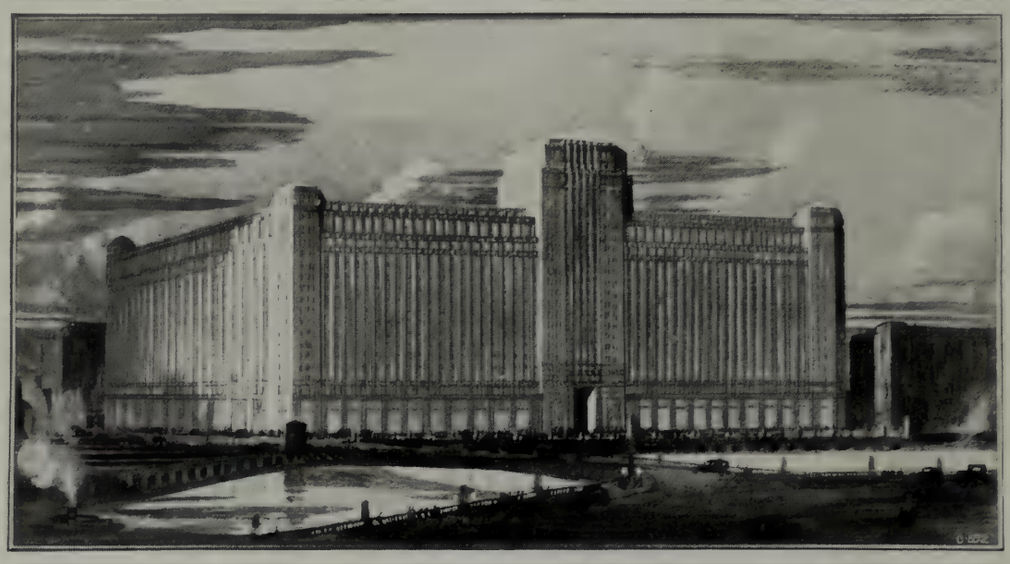
*CELLized Wood Floor Blocks are guaranteed. Laid only by Licensed Flooring Contractors.

*CELLized Oak Flooring Inc.

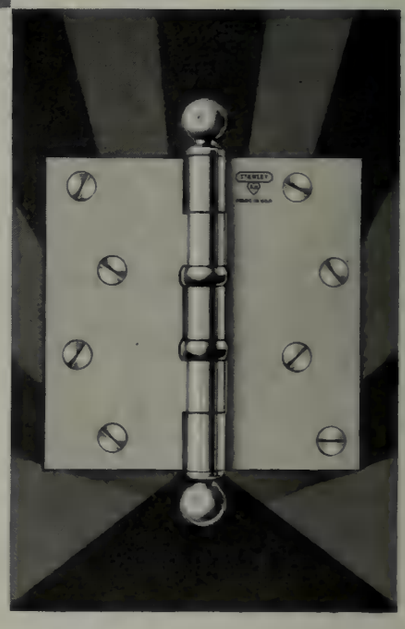
MEMPHIS — TENNESSEE

Sold through lumber dealers everywhere; manufactured by

THE LONG-BELL LUMBER CO. . Kansas City, Mo. ARKANSAS OAK FLOORING CO. . Pine Bluff, Ark.
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STANLEY
S.W.



PERMANENCY

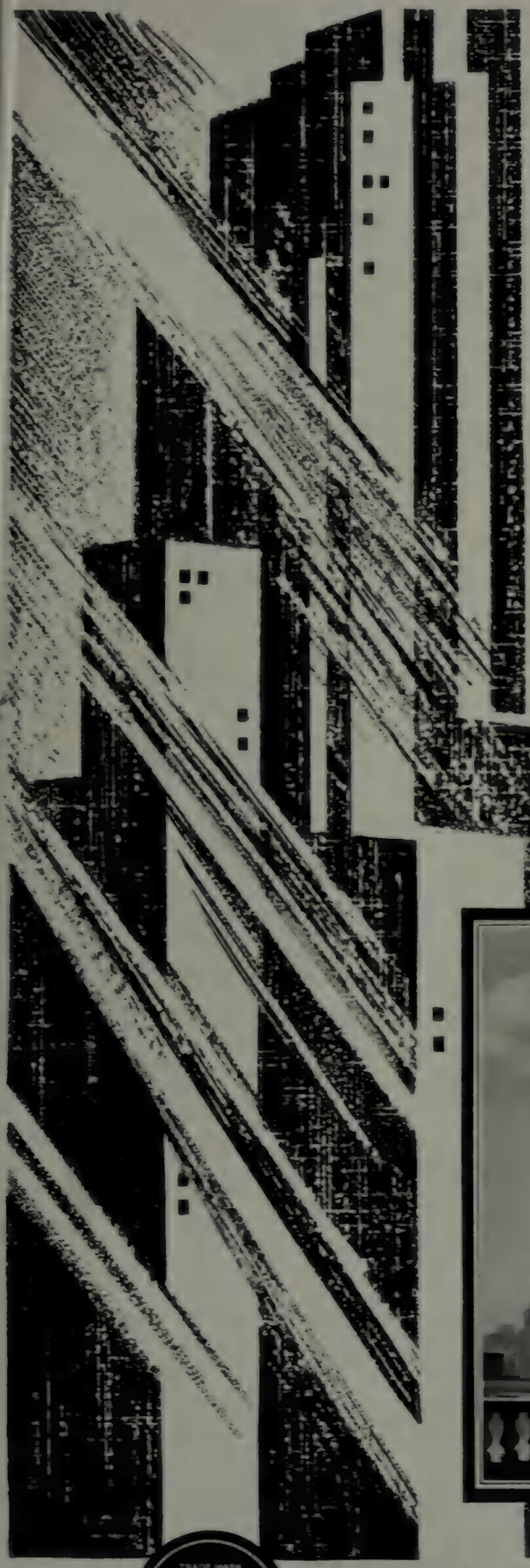
STANLEY Ball Bearing Hinges swing more than 2000 doors in the Chicago Merchandise Mart.

Architects, Graham - Anderson - Probst and White, have spared no effort to produce a building which will be a source of satisfaction to occupants for years to come. To assure smooth, trouble - free operation of the doors for the life of the building, Stanley Ball Bearing Hinges were used.

STANLEY BALL BEARING HINGES

You will find our "Architects Manual of Stanley Hardware" useful in your own work. A copy will be sent upon request.

THE STANLEY WORKS
New Britain, Conn.



AMONG the prominent buildings gracing Chicago's famed Michigan Boulevard, as seen from the monumental peristyle, Grant Park, are several typical structures which furnish proof of the inherent excellence of Pratt & Lambert products as interior finishes.

Two outstanding examples are furnished by the recently erected Willoughby Tower (approximate center) on the interior trim of which "38" Preservative Varnish was used, and the new Pittsfield Building (extreme right between columns) where Vitraloid Lacquer was used on the interior trim.

"38" Preservative Varnish, in its natural high, rich gloss or rubbed to a satiny dull finish, enhances any wood surface. Vitraloid Lacquer, Clear Gloss and Dull Finish, meets today's demand for speedy finishing of a large project with a durable, instantly-dry material.

Call the nearest P&L Architectural Service Department for complete information on any finishing problem.

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"Save the surface and you save all" Pratt & Lambert



MICHIGAN BOULEVARD, CHICAGO, AS SEEN FROM THE MONUMENTAL PERISTYLE, AT NORTH END OF GRANT PARK

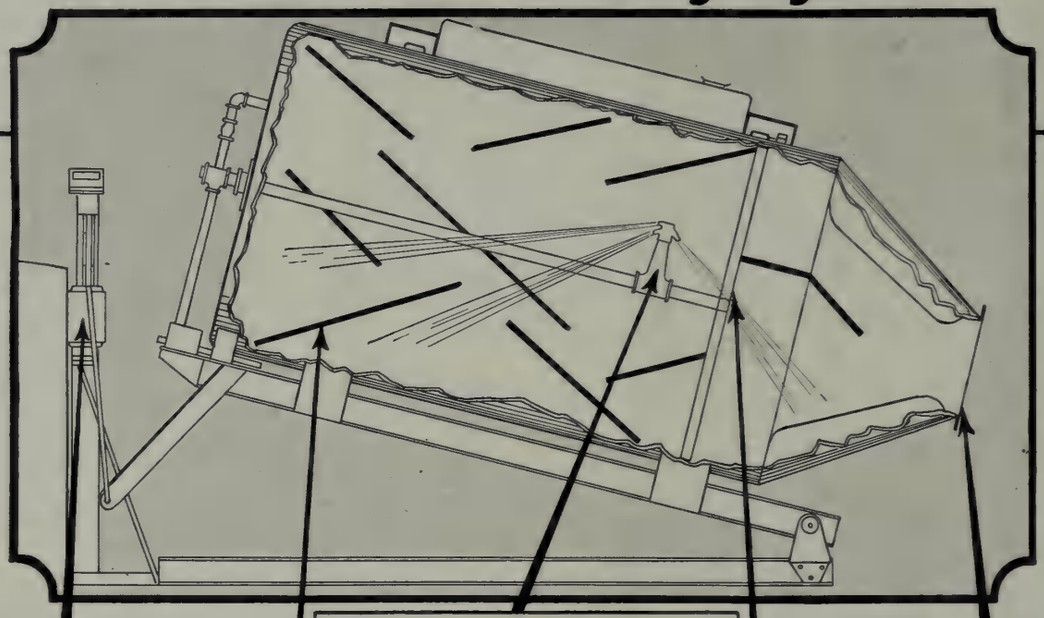
PRATT & LAMBERT

Varnish Products

"PROFIT FROM EXPERIENCE"

PROVEN PRINCIPLES

Scientifically designed to mix and deliver concrete without segregation



HOIST

A time-tested and proven feature used entirely for elevating and discharging mixer. Discharging operation requires no assistance from mixing blades, therefore permitting continuous mixing during discharge.

WATER

High level water discharge under pressure combines ability to carry large loads in proportion to size of mixer, perfect distribution of water and cleansing action after discharging.

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The single small opening on Paris TRANSIT Mixers provides absolute control of discharge under all operating conditions and enables the high loading and concentration of aggregates by revolution during loading so necessary to economical operations.

MIXING BLADES

The scientific arrangement of blades in transit mixers is an important feature. The blades in Paris TRANSIT Mixers are designed solely for mixing and are not required to aid discharging.

SPOKES

Are another important structural feature affording rigid support to water line and roller tracks, thereby providing the necessary strength for the exceedingly large pay loads carried without adding excessive weight.

PARIS TRANSIT MIXERS

All of the above features are built around and made possible by the use of the hoist. Large loads cannot be introduced nor the full capacity of the mixer used by an arrangement of blades alone. "A full barrel rolls easiest." The same principle applies to a mixer. Paris TRANSIT Mixers, using these fundamental laws of mechanics, are unequaled for economy of operation and size of pay load.

"PROFIT FROM EXPERIENCE"



TRANSIT MIXERS, Inc.

Call Building, San Francisco

New York Chicago Vancouver, B. C

There are Many different ways in which Alcoa Aluminum Serves the Architectural Designer

All unnoticed perhaps, aluminum, which means "pots and pans" to most of us, has come a long way since it was first used in architectural design forty-six years ago. Today, as an architect, you can specify—and one, or several, of 177 leading manufacturers will fill your order for—Alcoa Aluminum Conduo Base, Mop-strip, Casement and Sash, Kick Plates, Hinges, Ball Bearing Butts, Rolling Doors, Lamp Standards and Brackets, Radiators, Screen Frames, Shingles, Hollow Doors and Trim — these and perhaps a score more building products.

Here are forty-five ways

Balustrades	Entrances	Marquises	Risers	Spandrels
Columns	Fascias	Newels	Saddles	Stair Railings
Conduit	Frames	Ornamental Fences	Sash	Statuary
Coping Tiles	Grille Work	Panels	Screens	Store Front Work
Cornices	Gratings	Partitions	Scuppers	Store Facing
Cresting	Gutters	Pendants	Sheet Roofing	Treads
Doors	Lamp Standards	Pilasters	Shingles	Ventilators
Door Hardware	Lighting Fixtures	Radiators	Sills	Weather Strip
Down Spouts	Mail Chutes	Radiator Covers	Skylight Frames	Window Frames

Here are the 177 Leading Manufacturers who regularly fabricate Alcoa Aluminum Building Products and Specialties

Abbott & Ney Co., Inc.
New York, N. Y.
Aluminum screens
Aluminum ventilators

Acme Pattern Works
Kansas City, Mo.
Fabricating ornamental aluminum castings

Acme Steel Screen & Mfg. Co.
Chicago, Ill.
Aluminum strong alloy screens

Alan Wood Steel Company
Conshocken, Pa.
Rolled aluminum tread floor plates

Alexander-Johns Co.
Philadelphia, Pa.
Skylights

Allith-Prouty Company
Danville, Ill.
Airport door hardware
Warehouse door hardware

American Abrasive Metals Co.
New York, N. Y.
Safety door saddles
Safety elevator door sills
Safety stair treads

American Iron and Wire Works
Chicago, Ill.
Architectural metal fabricators

American Sheet Metal Works
New Orleans, La.
Sheet aluminum architectural products

American Skylight Co.
Chicago, Ill.
Ventilating skylights

American Mason Safety Tread Co.
Lowell, Mass.
Aluminum step plates
Stair treads
Nosing

American 3-Way Luxfer Prism Co.
Cicero, Ill.
Sidewalk, roof & transom lights
Ventilators

American Warming & Ventilating Co., The
Toledo, Ohio
Louvers & screens
Sidewalk grilles
Mixing louvers & by-pass dampers
Back pressure dampers

Anco Mfg. Co.
Chicago, Ill.
Store fronts

Art Metal Construction Co.
Jamestown, N. Y.
Decorative & architectural aluminum
Hollow metal doors & trim

Atchison Revolving Door Co.
Independence, Kans.
Revolving doors & enclosers for entrances

Atlas Iron & Steel Company
Detroit, Mich.
Decorative & architectural aluminum of all kinds.

Bach, Oscar B.
New York, N. Y.
Decorative & architectural aluminum
Doors

Beardslee Chandelier Mfg. Co.
Chicago, Ill.
Lighting fixtures

Becker Co., Geo. H.
New York, N. Y.
Architectural aluminum

Blaski Manufacturing Co.
Chicago, Ill.
Ventilating skylights

Bliss Steel Products Corp.
East Syracuse, N. Y.
Office windows

Blum & Co., Inc., Julius
New York, N. Y.
Extruded aluminum shapes for architectural and ornamental purposes

Braun Company, J. G.
Chicago, Ill.
New York, N. Y.
San Francisco, Calif.
Extruded aluminum shapes for architectural work
Door saddles
Window sills

Breese and Son, F. J.
Detroit, Mich.
Aluminum weatherstrip
Aluminum threshold

Burt Manufacturing Co.
Akron, Ohio
Stationary, revolving & direct connected fan roof ventilators

Campbell Metal Window Corp.
New York, N. Y.
Double hung windows
Campbell casement windows

Chamberlin Metal Weather Strip Co., Inc.
Detroit, Mich.
Aluminum rolling screen

Chapman Co., Inc., Wm. O.
Brooklyn, N. Y.
Decorative & architectural aluminum

Cleveland Wire Cloth & Mfg. Co.
Cleveland, Ohio
Aluminum wire cloth & screen

Coburn Trolley Track Mfg. Co.
Holyoke, Mass.
Bar, extruded & sheet fabrications

Coleman, Adelbert E.
Chicago, Ill.
Architectural metal fabricators

Corbin, P. & F.
New Britain, Conn.
Locks & Builders' hardware

Cox, Nostrand & Gunnison
Brooklyn, N. Y.
Lighting fixtures

Crescent Steel Co.
St. Louis, Mo.
Windows
Casements
Factory sash

Crown Iron Works
Minneapolis, Minn.
Architectural aluminum

Cutler Mail Chute Co.
Rochester, N. Y.
Mail chute equipment for office, hotel, apartment & public buildings

Dahlstrom Metallic Door Co.
Jamestown, N. Y.
Elevator entrances
Hollow metal doors & trim
Mop strip
Conduo base

Detroit Show Case Company
Detroit, Mich.
Store front moldings
Hollow metal moldings

Eagle-Heath Bronze Corp., The
Mount Vernon, N. Y.
Decorative & architectural aluminum

Edwards Co., The O. M.
Syracuse, N. Y.
Counters
Cases
Desks
Vault equipment
Document files of aluminum

Ellison Bronze Co., Inc.
Jamestown, N. Y.
Decorative & architectural aluminum

Empire City Iron Works
Long Island City, N. Y.
Anything in ornamental or architectural cast, wrought or extruded aluminum

Empire Fireproof Door Co.
New York, N. Y.
Reinforced extruded aluminum doors

Estey Bros. Co., Inc.
Brooklyn, N. Y.
Decorative & architectural aluminum

Fells, Lent, Cantor & Katz
Long Island City, N. Y.
Store fronts
Extruded aluminum doors

Ferro-Co Corporation
Brooklyn, N. Y.
Miscellaneous products designed & built to order

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Rochester, N. Y.
Architectural & decorative aluminum for all purposes

Friedley-Voshardt Co.
Chicago, Ill.
Sheet metal ornamental stampings

Garrison Bronze Corp.
Chicago, Ill.
Ornamental store fronts
Bank fixtures

General Bronze Corp.
Minneapolis, Minn.
Architectural aluminum

Globe Wire & Iron Works
Milwaukee, Wis.
Elevator grilles
Bank doors
Interior grilles

Gorham Co., The, Bronze Division
Providence, R. I.
Fine architectural and ornamental metal work of any description
Sculptural castings

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Decorative & architectural aluminum

Halback & Co., C. E.
Brooklyn, N. Y.
Ornamental castings, spandrels, desks, doors, casement windows

Hansell-Elcock Company
Chicago, Ill.
Architectural metal fabricators

The Harrington & King Perforating Co.
Chicago, Ill.
Grilles & ventilators of perforated aluminum

Harsch Bronze & Foundry Co., John
Cleveland, Ohio
Ornamental parts
Extruded store fronts & doors

Hasselman and Salterini, Inc.
New York, N. Y.
Decorative & architectural aluminum

Hauenstein & Burmeister, Inc.
Minneapolis, Minn.
Window screens & screen doors

Hauserman Co., E. F.
Cleveland, Ohio
Metal partitions (movable) for offices & factories

Herrmann & Grace Co.
Brooklyn, N. Y.
Hollow windows
Doors
Air ducts
Clothes chutes

Hill-Standard Company
Anderson, Ind.
Playground & swimming pool equipment

Himmel Brothers Company
New Haven, Conn.
Rolled & extruded Store fronts & doors

Hirschman Co., Inc., W. F.
Buffalo, N. Y.
Roof ventilators

Hope & Sons, Inc., Henry
New York, N. Y.
Casements
Windows

Hunger Brass Co., H. J.
Cleveland, Ohio
Toilet partition hardware for marble

Ilg Electric Ventilating Co.
Chicago, Ill.
Ventilating Systems

Imperial Brass Mfg. Co.
Chicago, Ill.
Building hardware

International Casement Co., Inc.
Jamestown, N. Y.
Casements
Windows
Hollow metal window frames & Spandrels

Intervale Iron Works, Inc.
New York, N. Y.
Miscellaneous architectural aluminum

Ionia Ventilator Co., Inc.
Philadelphia, Pa.
Ventilators

Irving Iron Works Company
Long Island City, N. Y.
Aluminum gratings & stair steps
Dining car kitchen floor mats

Ivanhoe Division of the Miller Company
Cleveland, Ohio
Aluminum lighting equipment
Vapor proof equipment

Jackson Company, Wm. H.
Brooklyn, N. Y.
Decorative & architectural aluminum

Jamestown Metal Desk Co., Inc.
Jamestown, N. Y.
Elevator doors & fronts
Hollow metal doors

Jamestown Screen & Mfg. Co., Inc.
Jamestown, N. Y.
Bank & vision screens
Window, door, porch & roll screens

Jensen Foundry Company
Detroit, Mich.
All kinds of architectural aluminum castings for buildings

Johnson-Meier Company
Chicago, Ill.
Architectural metal fabricators
Lighting fixtures
Elevator doors

Jones & Co., Trevor F.
New York, N. Y.
Grilles, tablets, plaques, signs, letters, figures

Jury Metal Arts Company
Detroit, Mich.
Aluminum for interior & exterior decorative purposes

Kantack & Company, Inc.
New York, N. Y.
Special lighting fixtures
Hardware
Grilles

Kawneer Company, The
Niles, Mich.
Hollow metal doors
"Sealair" in-swinging windows
Store fronts

Kernchen Ventilator Co.
Chicago, Ill.
Ventilators

Kloes, Inc., F. J.
New York, N. Y.
Awning & canopy frames
Awning outrigger equipment

Knapp Bros. Mfg. Co.
Chicago, Ill.
Metal building specialties
Sanitary metal trim
Conduo base, Mop strip

Kohl and Vick Iron Works
Chicago, Ill.
Architectural metal fabricators

Kornbrodt Kornice Kompany
Kansas City, Mo.
Fabricators of sheet aluminum for architectural purposes

Krans & Trustin
Omaha, Neb.
Ornamental contractors

Lewis Co., Fred H.
Chicago, Ill.
Shower bath compartments & pans

Lingo & Son, Inc., John E.
Camden, N. J.
Flagpoles

Long Island Wire Works, Inc., The
Brooklyn, N. Y.
Wire grill work
Bank cages

Lord & Burnham Company
Irvington, N. Y.
Des Plaines, Ill.
St. Catherines, Ontario, Can.
Greenhouses
Sash operating apparatus
Sludge beds

Lundell-Eckberg Mfg. Co., Inc.
Jamestown, N. Y.
Casements
Sash windows

Lupton Sons & Co., David
Philadelphia, Pa.
Casements
Sash
Commercial doors

Macomber Steel Co.
Canton, Ohio
Aeroplane hangar doors

Manhattan Perforated Metal Co., Inc.
Long Island City, N. Y.
All kinds of perforated aluminum sheets

Marty Iron Works, A. H.
Cleveland, Ohio
Extruded aluminum store fronts
Extruded doors, grilles, railings

McDougall & Potter Co.
New York, N. Y.
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Metal Door & Trim Co.
La Porte, Ind.
Elevator enclosures
Metal trim rolled shapes
Swing door units

Michaels Art Bronze Co., Inc., The
Covington, Ky.
Decorative & architectural aluminum

Miller Company, The
Cleveland, Ohio
Meriden, Conn.
Ivanhoe lighting fixtures

Miller & Doing
Brooklyn, N. Y.
Ornamental sheet stampings

Mills Company, Incorporated, The
Cleveland, Ohio
Aluminum partitions of all kinds

Model Iron & Aluminum Corp.
New York, N. Y.
Casements
Ventilators
Store fronts
Sash of every description

Moynahan & Duchene, Inc.
Detroit, Mich.
Decorative & architectural aluminum

Mutual Metal Mfg. Co.
Chicago, Ill.
Lighting fixtures

National Regulator Co.
Chicago, Ill.
Ventilating equipment

Nelson Corporation, The Herman
Moline, Ill.
Invisible radiators
"Hiiet" unit heaters
"Univent" & "Volu-Vent" ventilators

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Newman Manufacturing Co.
Cincinnati, Ohio
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Railings

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Chicago, Ill.
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Pneumatic conveyors

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Maplewood, N. J.
Aluminum insect screens & frames

Page Fence Association
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Wrought fencing

Painesville Metallic Binding Co., The
Painesville, Ohio
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Paltridge Metal Equipment Co.
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Payson Manufacturing Co.
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Philadelphia, Pa.
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Camden, N. J.
Architectural sheet metal ornaments

Progressive Brass Mfg. Co.
Kansas City, Mo.
Tulsa, Okla.
Aluminum sand castings

Pyle-National Company
Chicago, Ill.
Floodlights

Richey, Browne & Donald, Inc.
Maspeth, N. Y.
Windows
Casements
Sash

Riesner, Inc., Benjamin
New York, N. Y.
Sheet roofing
Louvers

Rixson Co., Oscar C.
Chicago, Ill.
Door hardware

Robertson Company, H. H.
Pittsburgh, Pa.
Sash
Skylights
Smoke jacks
Ventilators

Reliance Bronze & Steel Corp.
Brooklyn, N. Y.
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Cleveland, Ohio
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Locks & builders' hardware

Schaeffer Company, The
Chicago, Ill.
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Schreiber & Sons Company, The L.
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Extruded aluminum shapes

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Long Island City, N. Y.
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Shannon Metalcraft Corp.
Philadelphia, Pa.
Ornamental & architectural aluminum

Shean Steel Window Co.
Chicago, Ill.
Sheet metal fabricators

Simpson-Frisch Co.
Chicago, Ill.
Ornamental metal

Smyser Royer Company
York, Pa.
Ornamental & architectural aluminum

Southern Ornamental Iron Works
Dallas, Tex.
Decorative & architectural aluminum

Southwestern Ornamental Iron Company
Kansas City, Mo.
Decorative & architectural aluminum

Stanley Works, The
New Britain, Conn.
Ball bearing butts
Builders' hardware

Steelbilt Products Corp.
Clifton, N. J.
Hollow metal doors & trim
Elevator enclosures

Stephens & Danner, Inc.
Woodhaven, N. Y.
Ornamental sheet metal work of aluminum

Superb Bronze & Iron Co., Inc.
Brooklyn, N. Y.
Decorative & architectural aluminum

Swartwout Co., The
Cleveland, Ohio
Rotary ball bearing ventilators

Sykes Sheet Metal Company
Chicago, Ill.
Sheet metal fabricators

Thermal Units Company
Chicago, Ill.
Concealed radiation
Unit heaters

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Wire cloth & screens

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Ornamental lamps & brackets

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Canton, Ohio
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Elevator fronts

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Chicago, Ill.
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Hollow metal doors

Wagner Architectural Iron Works, A. F.
Milwaukee, Wis.
Spandrels & grilles

Wakefield Brass Co., The F. W.
Vermilion, Ohio
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Miscellaneous reflectors

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Ornamental aluminum

Warren & Co., Walter G.
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Watson Manufacturing Co.
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Weis Mfg. Co., Inc., Henry
Elkhart, Ind.
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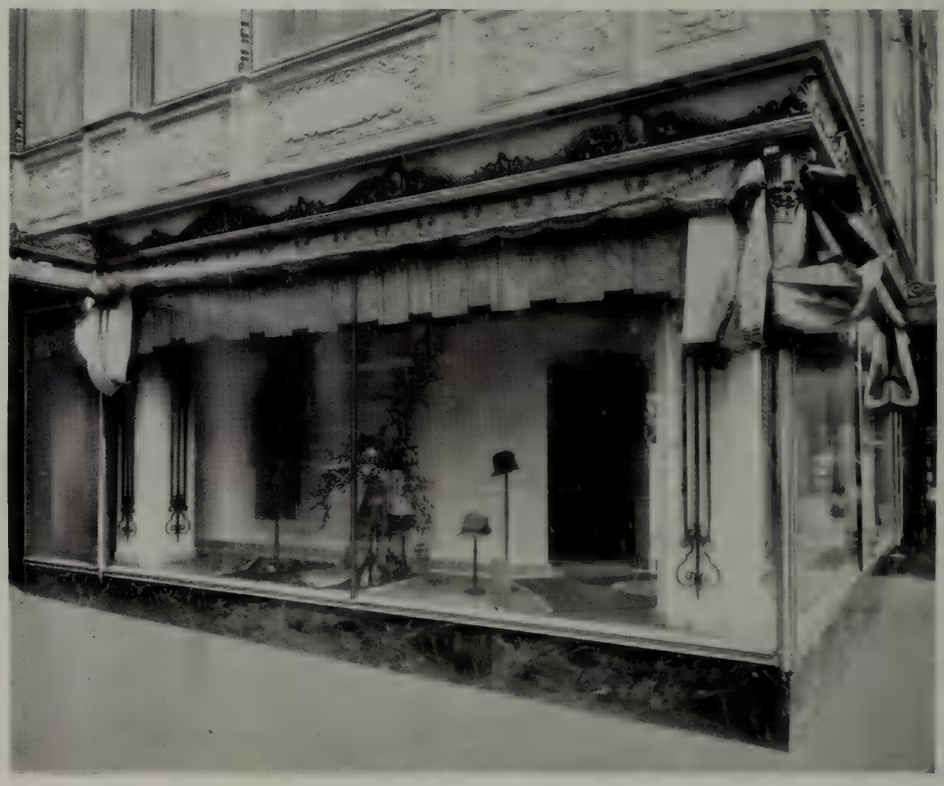
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bronze work in
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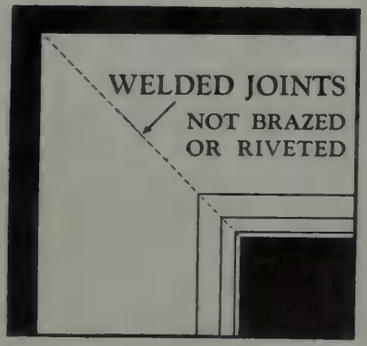
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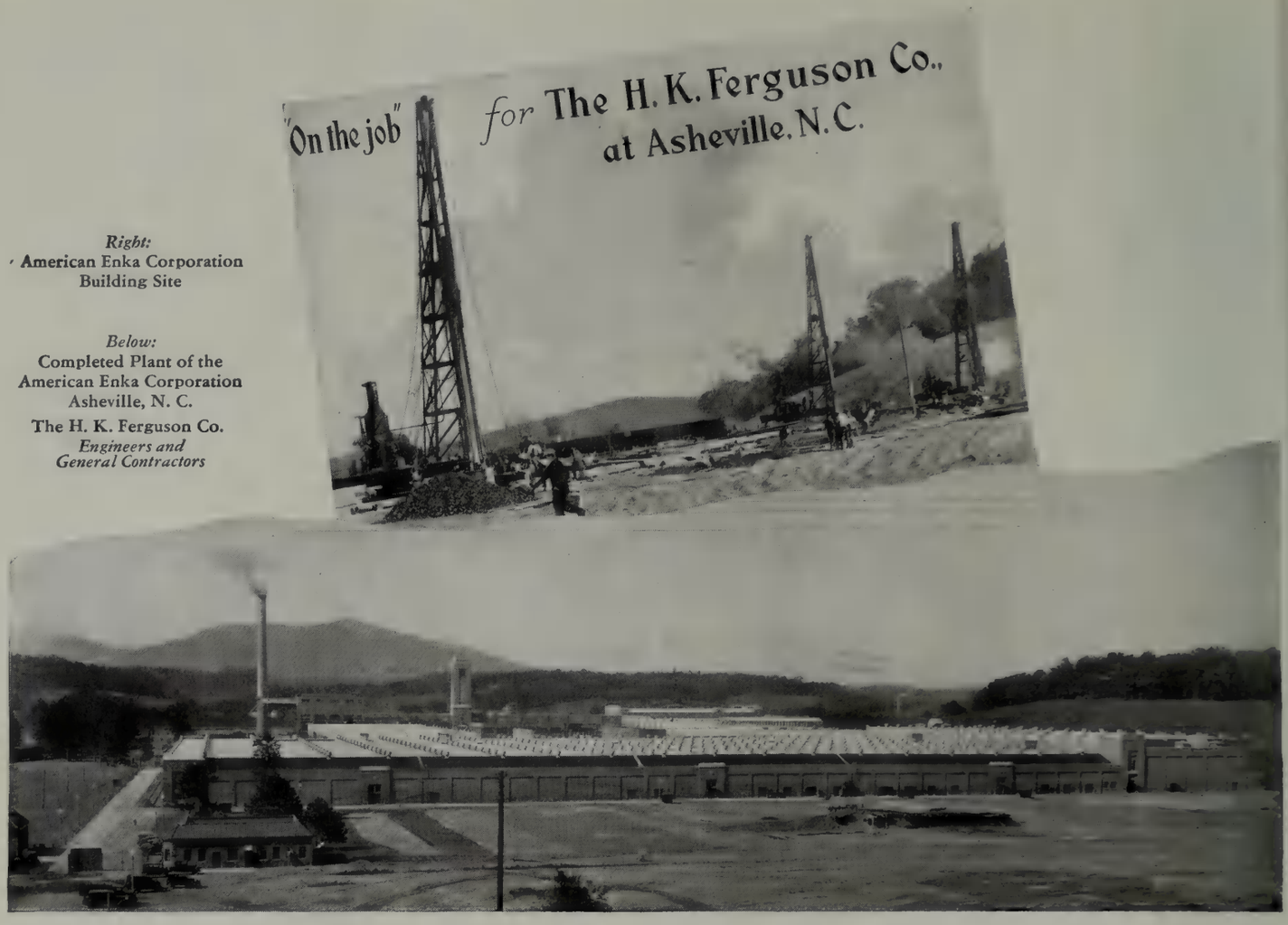
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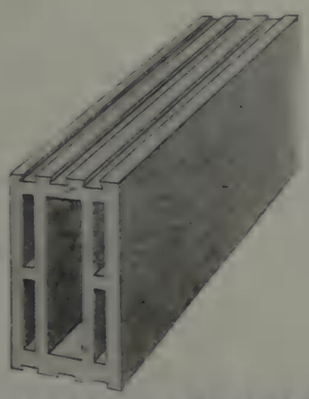
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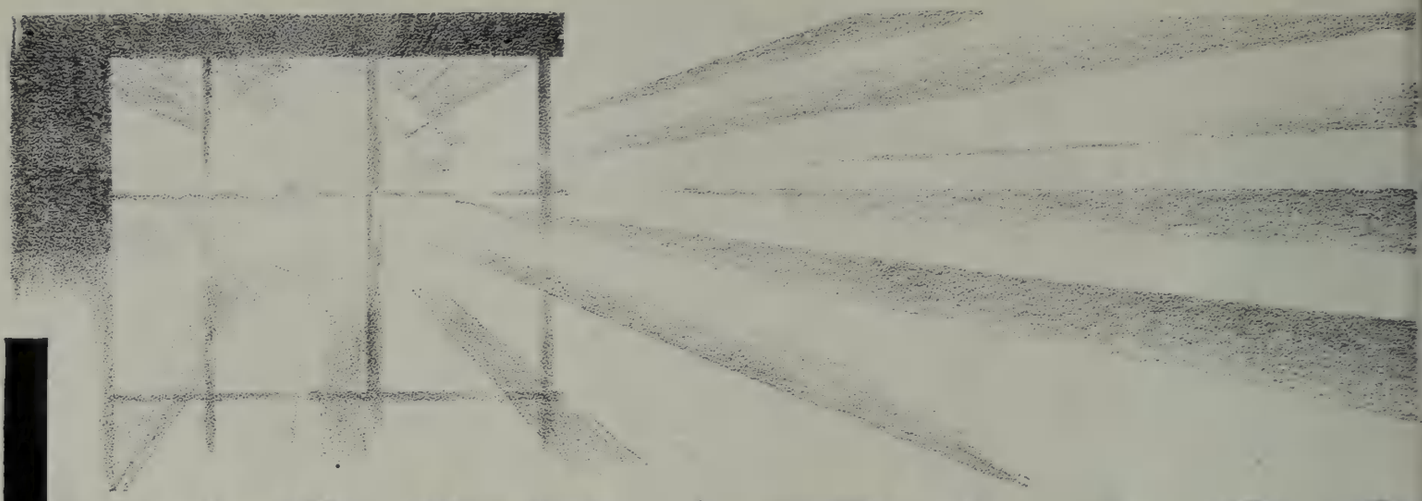


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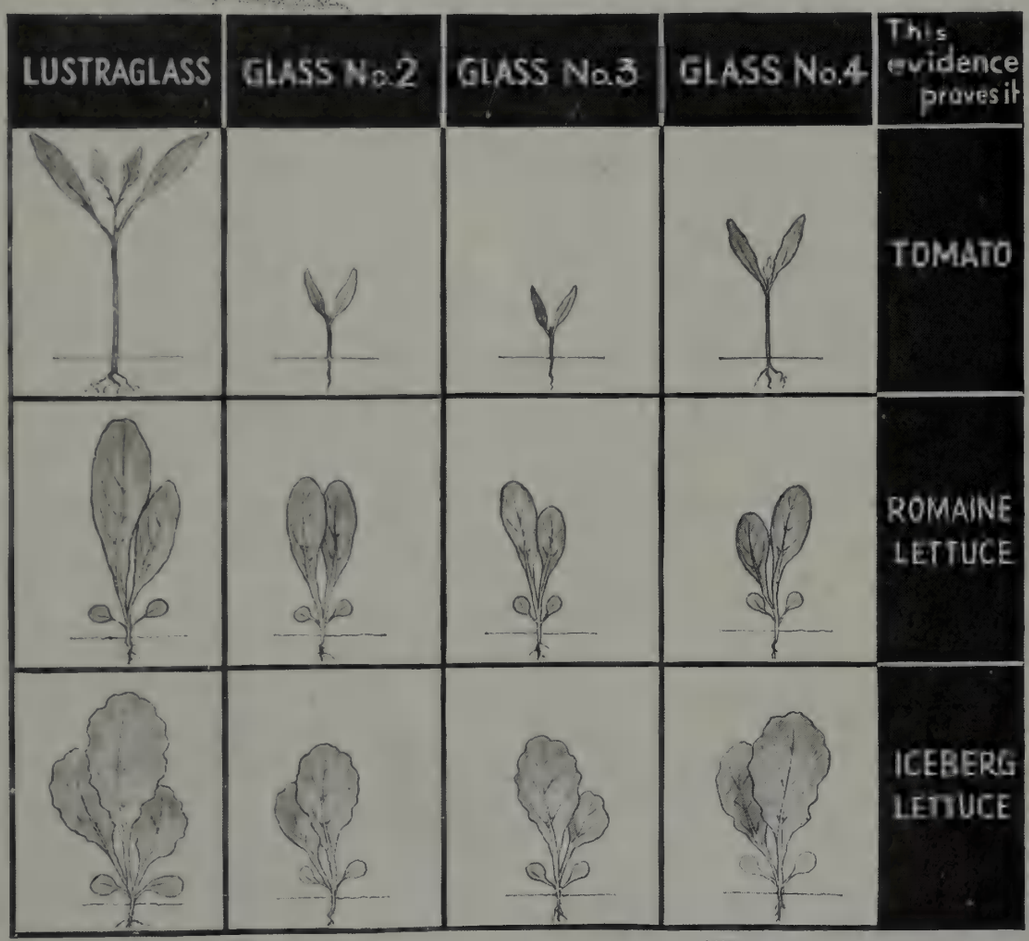
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Morris W. Scheibel, architect, Rowland M. Johnson, associate architect

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Superior in design—the Kalman door frame fits closely over tile and forms a definite unit with the wall structure. Thousands of slammings of a heavy door failed to cause even the slightest plaster crack.

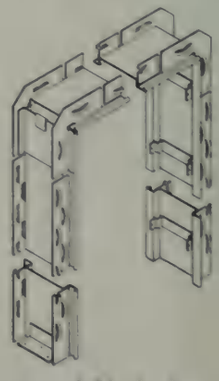
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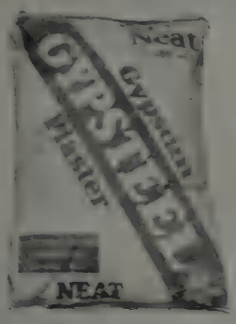
Walls

may "have ears"— but they *can't read!*

WALLS can't read the advertising about the Plaster that goes on them, so they don't know what to expect of it. A wall just has to put up with the Plaster your contractor puts on—whether it makes the wall feel strong or puny. Whether it slips easily, or drags across with leaden feet. So let's leave this question of using Gypsteel Gypsum Plaster to the walls and ceilings.

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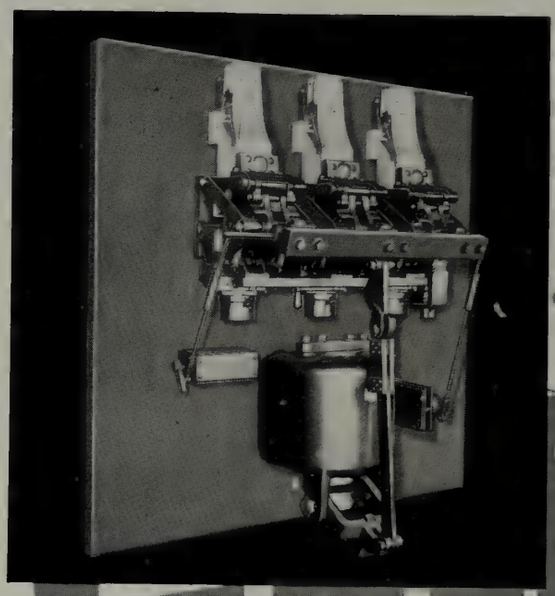
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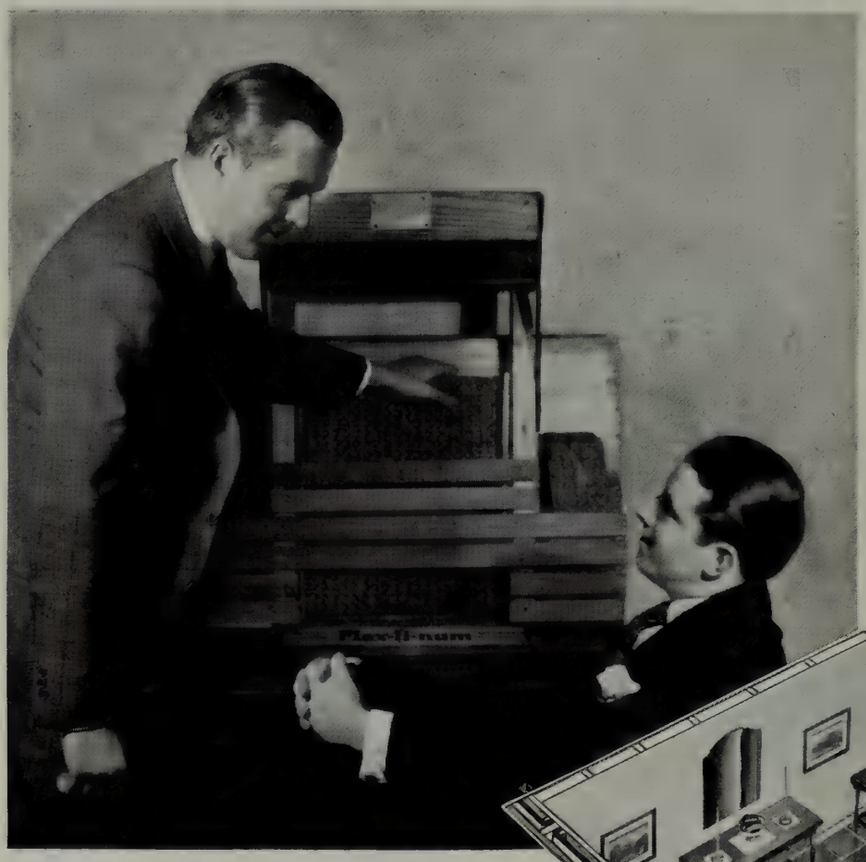
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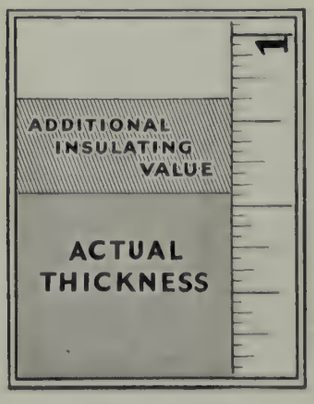


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A CORRECT BUILDING INSULATION AND SOUND CONTROL MATERIAL



Bronze entrance unit... Bronze counter screen... Bronze check desk...

Built by Art Metal for the Atlantic City Electric Co.



(Right)

Entrance unit in etched bronze. Doors, transoms, lights, complete with glass, hardware and saddle, were furnished for this new building of the Atlantic City Electric Co., by Art Metal. Architect, Vivian B. Smith of Atlantic City.



(Left)

Modern treatment features the bronze counter screen assembly in the same building. This is a specially built Art Metal cast bronze counter screen, with 13 center and end pilasters, hinge wickets, base rail, walnut-finished steel paneled gate in counter screen.



(Right)

Detail of the cast bronze check desk shows the same modernistic design used throughout. Reproduced in bronze by Art Metal craftsmen, it carries out the architect's original conception.

From more than forty years in manufacturing architectural bronze and hollow metal building equipment, Art Metal has a specialized knowledge valuable to architects. May we send a representative to consult with you on your next job? There is no obligation. Art Metal Construction Company, Jamestown, N. Y.

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everyone loses when the PLASTER cracks !

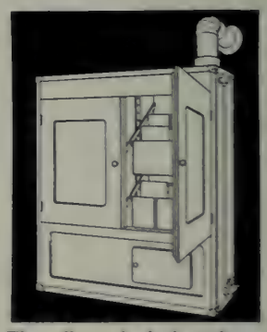
ARCHITECT—contractor—owner—all lose when unsightly cracks appear on plastered walls and ceilings.

Futile to explain away their existence by saying; "Ordinary lath naturally expands and contracts in changing moisture conditions;" that "cracks appear due to slight foundation settling."

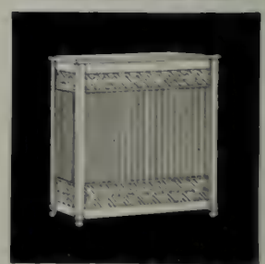
For the question then arises, "Why wasn't steel lath used instead?" Steel lath that prevents plaster cracking . . . that affords protection from fire . . . that eventually saves its own cost in minimized redecoration charges.

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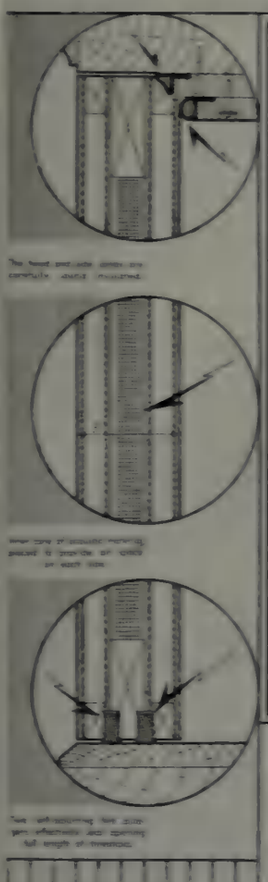


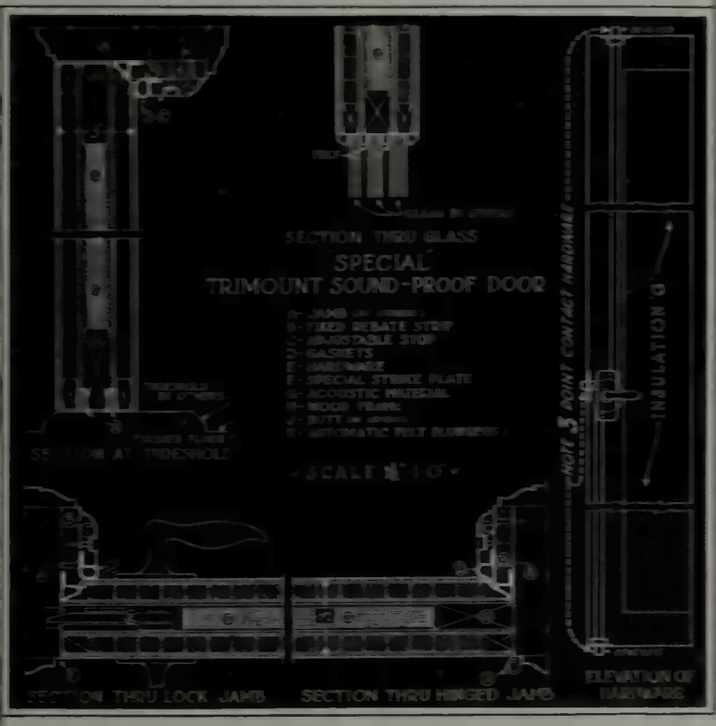
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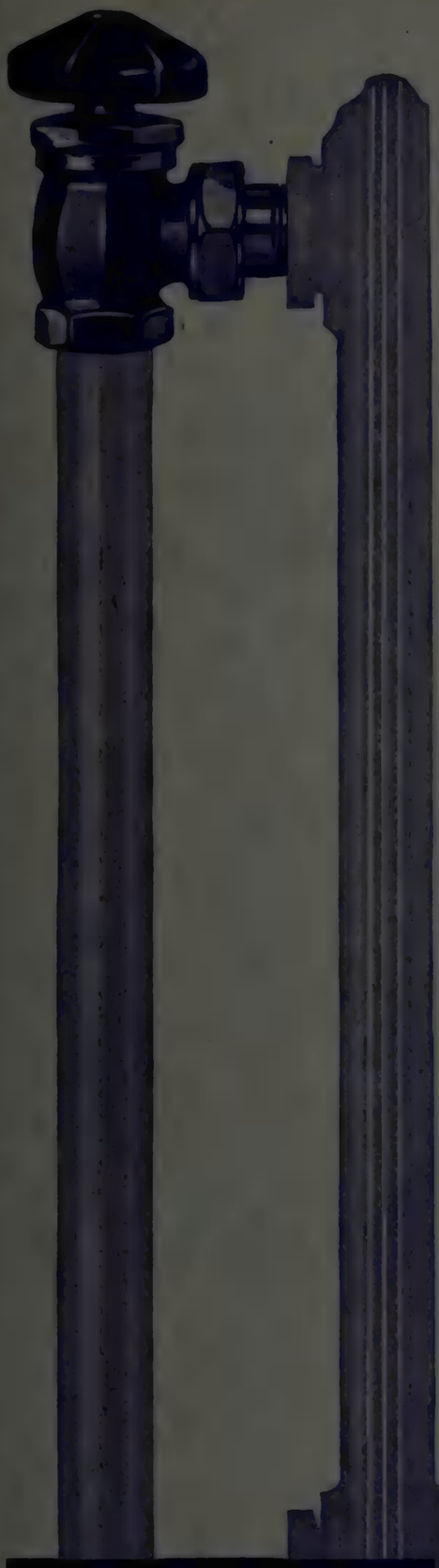
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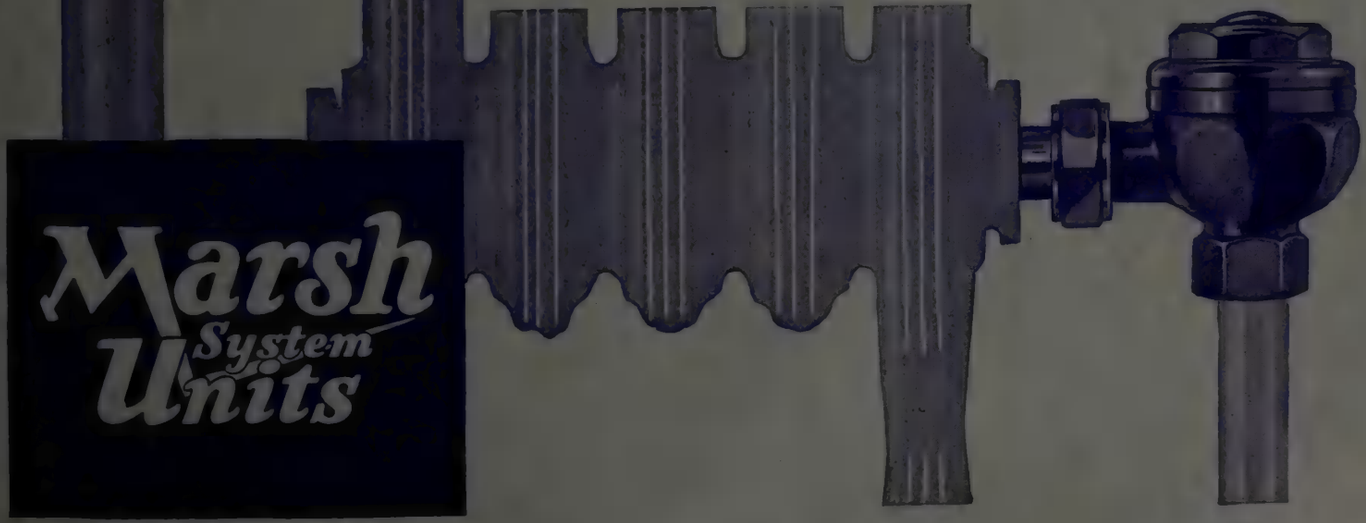
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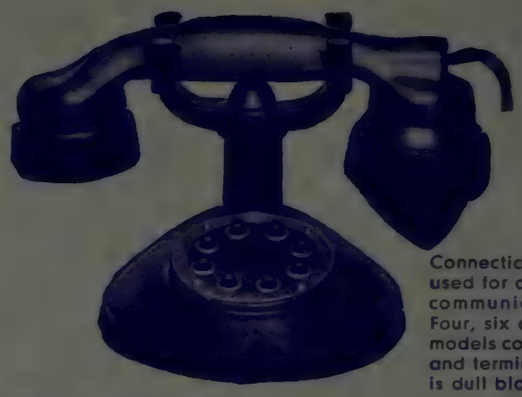
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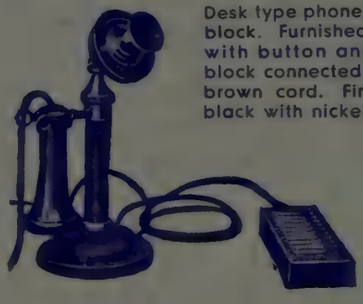
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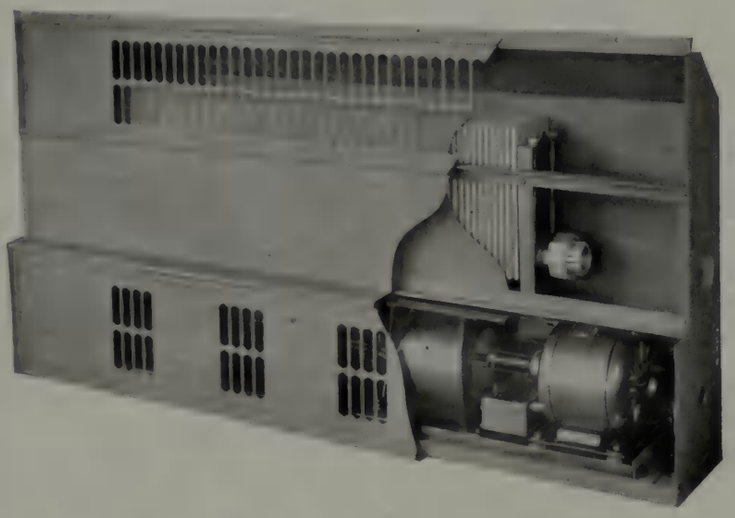
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Hartford Mortuary, El Paso, Texas. Guy L. Fraser, Architect. Fourteen Union Metal Columns 16" x 16' 10", Design No. 237, used.

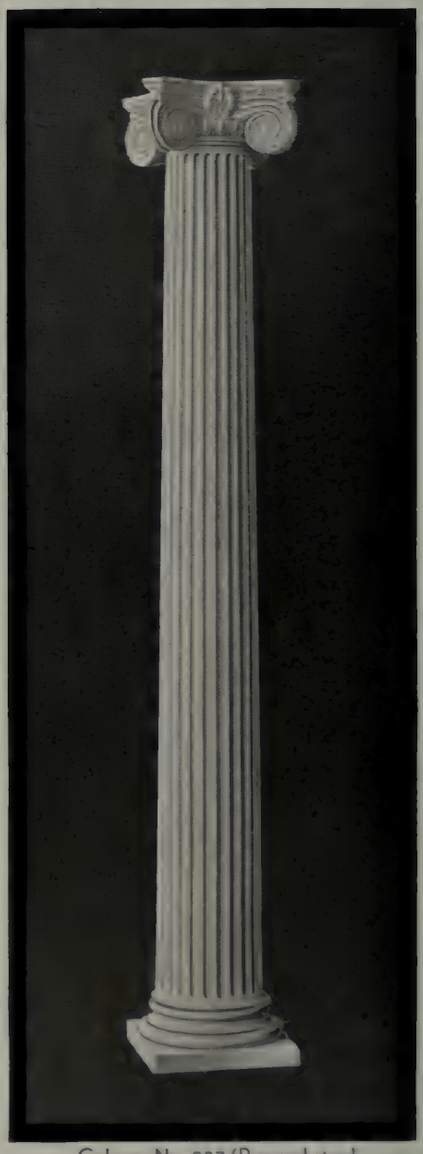
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There's "time" that goes "up the stack" too!

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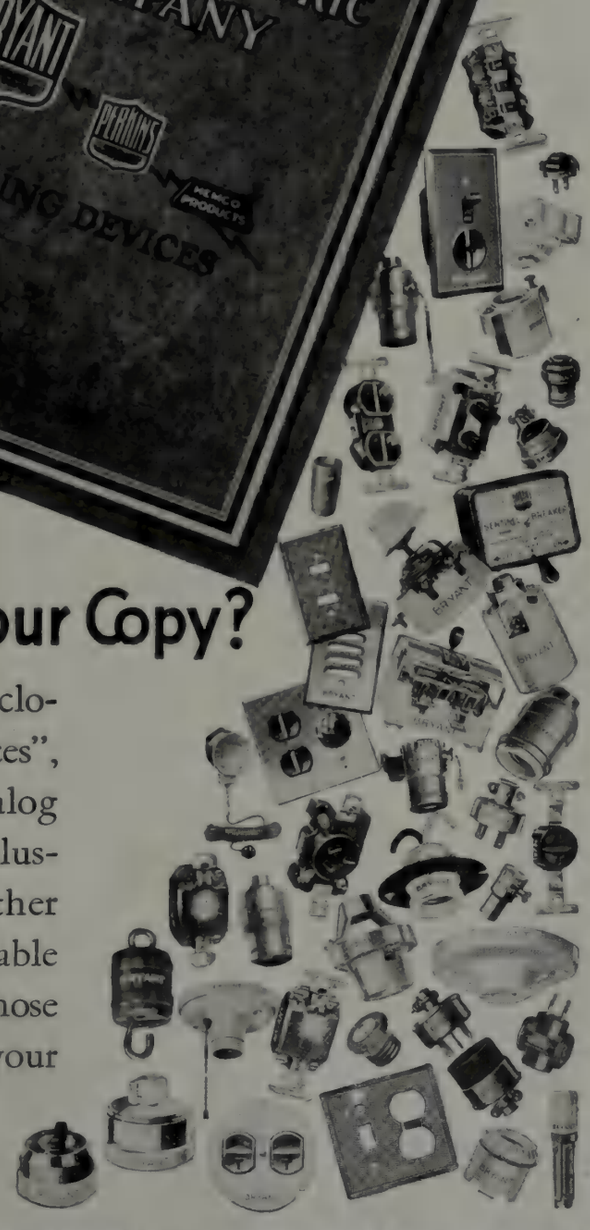




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A Jennings SUCTION SEWAGE Pump is located outside the pit

You can forget your boots when inspecting it . .

HERE'S a sewage pump that is always accessible. One that you can get at for cleaning or inspection without fuss or bother. Boots aren't necessary. There is no need ever to go down in the pit.

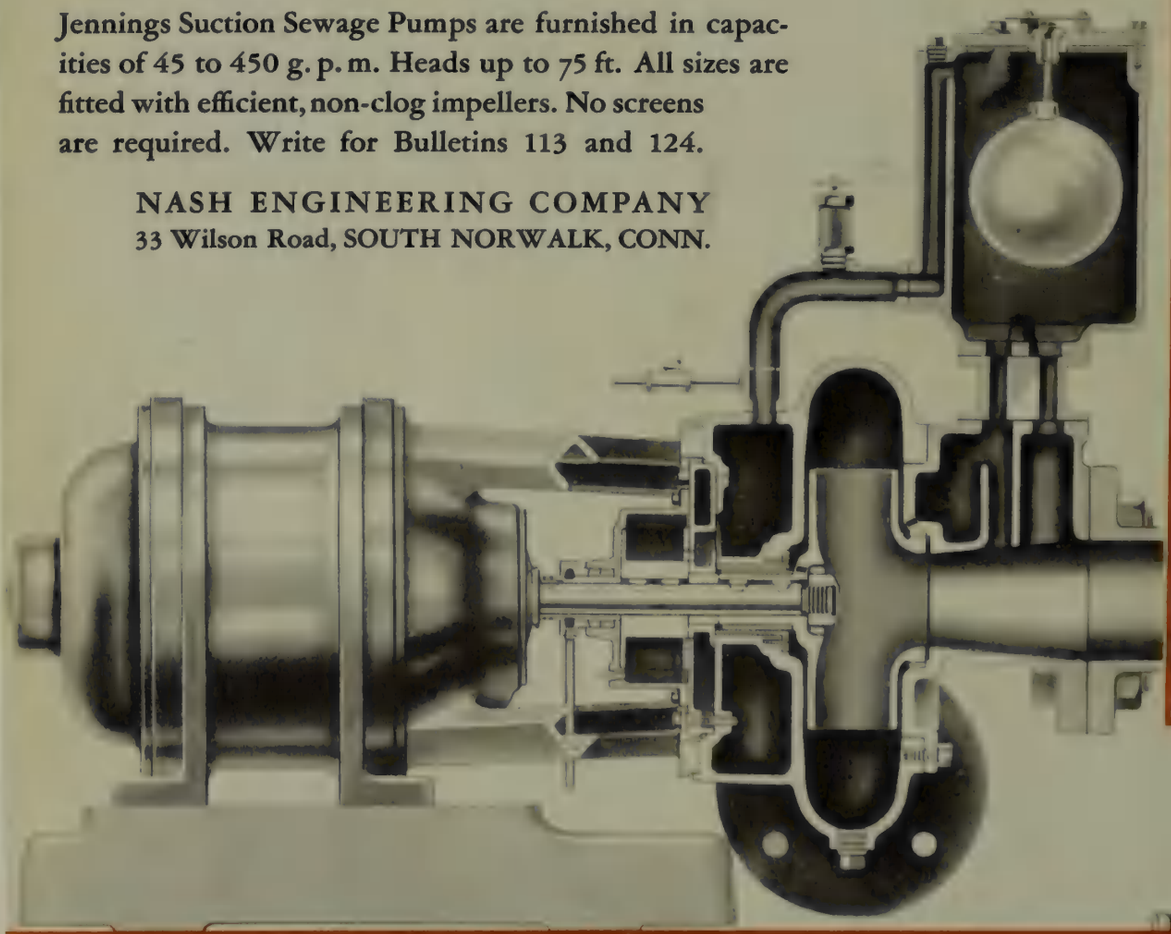
The Jennings Suction Sewage Pump is installed on the floor above the pit. Pump, motor and controls are right out in the open. A few minutes work with a wrench gives access to the interior. Impeller is removable without disturbing piping, packing or shaft alignment.

Jennings Suction Sewage Pumps are furnished in capacities of 45 to 450 g. p. m. Heads up to 75 ft. All sizes are fitted with efficient, non-clog impellers. No screens are required. Write for Bulletins 113 and 124.

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1. Motor is commercial, ball-bearing type selected for dependability always available from stock.
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7. Priming unit is a simple, sturdy Nash Hytor.
8. Iron catch basin has gas tight cover.
9. Controlling float switch is totally enclosed and oil immersed.
10. Ball float has adjustable stop.



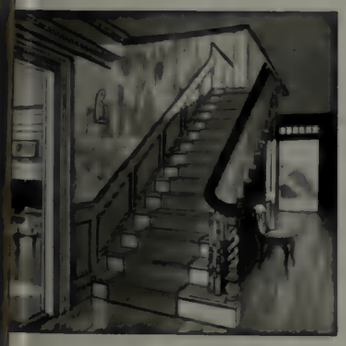
Jennings SUCTION SEWAGE *Pumps*

NASH ENGINEERING COMPANY SOUTH NORWALK, CONN. U. S. A.

...e roadside, the trees, the ...acious friendly home... all are UNCHANGED



The Ezra Griswold House, Guilford, Conn., built of White Pine in 1760 and standing today



THERE is quiet here and peace . . . the peace of things old and well-beloved. Trees that dapple the dusty road with shadows . . . the road, over which have passed the feet of generations. And softly enveloped in the calm of the country side, rests the old house — a home for generations.

If you were to walk down the elm-lined paths of a New England town, you would find other of these charming places. . . . Homes built when the country was finding itself . . . homes constructed by craftsmen who knew their work as few men have ever known it. It is not surprising to discover that almost all of these early dwellings were built of White Pine.

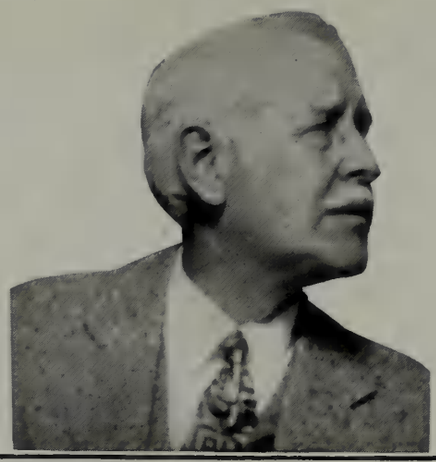
Today genuine White Pine may be selected for the houses that you design. Idaho (genuine) White Pine is nature's finest building lumber. Soft in texture, with a straight and delicately figured grain, it is easily worked. Paints, enamels, oils . . . whatever the treatment . . . provide a surface smooth with the sheen of satin, even and flat. And in spite of rain, and storm and cold, Idaho White Pine retains its luster, weathering with a beauty few other finishes approach.

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The trade-mark, imprinted on Idaho White Pine, is your conclusive assurance that the wood is genuine. There is a difference. Specify it by name. Western Pine Manufacturers Association, Portland, Ore.

IWP *This trade-mark is printed on Idaho White Pine at the mills—and is a definite protection for home owner, builder, architect and lumber dealer.*

IDAHO (GENUINE) WHITE PINE



"Please REPEAT *that last sentence*"

Proper acoustical treatment banishes these conference-room interruptions

INTERRUPTIONS and misunderstandings are almost inevitable in rooms whose walls and ceilings absorb too little sound and reflect too much. Proper acoustical treatment is essential in the modern business room or office.

Excessive reverberation, echo, interference, and other acoustical defects are easily corrected. By the scientific placing of Armstrong's Corkoustic, sound can be controlled and made clear and distinct.

Corkoustic is an Armstrong product, made of pure cork. It has sound absorbence sufficient for the correction of any acoustical conditions. It has structural adaptability and strength, and will not warp, buckle, or sag. It is easily applied and requires no unusual preparation of building surfaces. It can be used in old or new construction.

Only the ingenuity of the designer limits the decorative effects to be obtained with Armstrong's Corkoustic. In its natural rich brown, it harmonizes beautifully with stained wood. Where color is desired, cold water paint can be sprayed on and beautiful effects are obtained with stencils. Corkoustic is made in various sizes, surfaces, and finishes, allowing a wide variety of design.

In addition to providing acoustical correction, Armstrong's Corkoustic affords highly efficient insulation for walls and ceilings. Corkoustic-lined rooms are cooler in summer and much more easily heated in winter. This is a feature of particular importance for all top-floor rooms and for churches and auditoriums with large exposed roof areas.

If you have ever asked yourself: "What shall I do about acoustical treatment?" we suggest that you permit our engineers to offer you the benefit of their experience and training. And for complete information about Armstrong's Corkoustic in business rooms, churches, auditoriums, theatres, and similar rooms and also in shops, factories, and wherever workers are subjected to noisy surroundings, we'll be pleased to send you our illustrated book, "Acoustical Correction." Armstrong Cork and Insulation Company, 9 Concord Street, Lancaster, Pennsylvania.



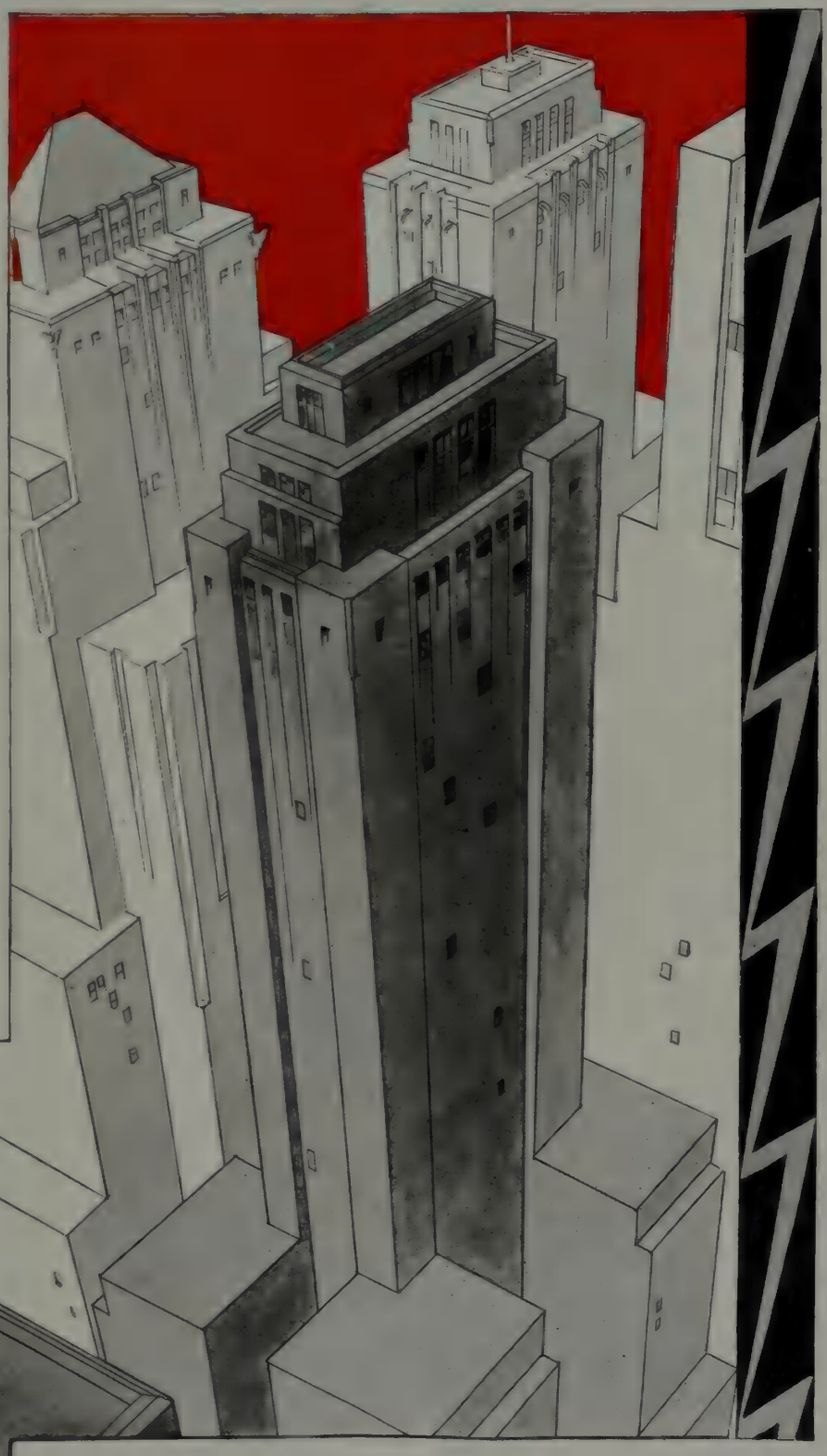
The directors' room of Oneida Community, Ltd., manufacturers of the famous Community Plate. A ceiling of Armstrong's Corkoustic. It enhances the decoration in which the richness of dark wood panelling and beams sets the dominant note.

Armstrong's Corkoustic

for the acoustical treatment of all buildings

Behind the scenes . . .

where unseen factors carry on



Imprisoned behind walls of brick, stone and mortar are the arteries of a modern building charged with an important responsibility.

Month in and month out, year after year they must serve without interruption. Only good dependable pipe like "Spang" Welded Pipe assures this long satisfactory service. Down through the years its record of service in many of the nation's finest buildings speaks for itself.

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Maccabees Building, Detroit, Michigan
Essex County Hall of Records, Newark, N. J.
David Stott Building, Detroit, Michigan
Savoy Plaza Hotel, New York City, N.Y.
Pennsylvania R. R. Building, Philadelphia, Pa.
Mutual Benefit Life Insurance Co. Bldg., Newark, N. J.

church fields standardized on these resilient floors—writing them into their specifications time after time? ¶ Service—that's the answer! And it covers both product-performance and installation-procedure. It means the kind of helpful, dependable planning and workmanship which only our experienced organization of authorized contractors can render. It means service in terms of floor quality, long life, economy. ¶ Let us tell you about our Guaranty Bond against repair expense. ¶ Let us send samples so that you may see the new Sealex Linoleums and Sealex Treadlite Tiles (cork-composition) which make our resilient floors—spot-proof, easy to clean.

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Bank of Italy Building, Los Angeles, Calif.
Detroit Masonic Temple, Detroit, Michigan
Cadillac Motor Car Co. Building, Detroit, Michigan
San Joaquin Light & Power Corp. Building, Fresno, California
Saks 5th Avenue, New York City, N. Y.
Montgomery Ward & Co. Building, Oakland, California

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Electric service for multitudes guarded by G-E RIGID CONDUIT

Corrosive salt sea air, humidity, age have little effect on electric wiring in Atlantic City's great Auditorium. Electric lines throughout this vast building serving throngs every year are carried in "G-E White," the conduit made to *endure.*

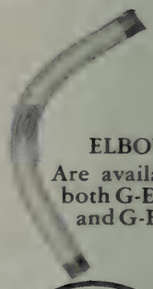
"G-E White" can be depended upon anywhere because it defeats rust . . . defies time.

It is *hot-dipped galvanized.* A heavy zinc coating, outside and in, alloyed onto best grade mild steel tubing enables it to meet tests more severe than any ordinary galvanized conduit.

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G-E Rigid Conduit of either type makes wiring *permanent.* You can get it anywhere from G-E Merchandise Distributors—or write Section C 157, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



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G-E White—Stripped View



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These Fittings Simplify Installation

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If you are faced with any construction problem, let the National Lumber Manufacturers Association help you. Expert in every phase of lumber technology and engineering methods, the services of a technical staff are offered you free of charge or obligation.

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Northern Life Insurance Company Tower, Seattle, Washington . . . An outstanding example of present-day architecture . . Lime-cement mortar changed in color from heather brown at bottom to cream tan at 27th floor, to conform to color grading of the brickwork . . . A. H. Albertson and Associates, Architects.

LIME « « For Non-Staining Masonry Walls

WHEN a combination of good architectural design, high-grade workmanship and the use of first-class building materials produces such beautiful and outstanding structures as the Northern Life Tower, illustrated above, why run the risk of obtaining results which are not pleasing?

Many similar structures are marred by the presence of staining or efflorescence on the exterior masonry walls. Efflorescence is caused by certain soluble salts present in masonry units and mortar materials, which salts are carried to the surface by rain water entering through leaky walls. It becomes noticeable as a white scum which forms on the exterior surface of the walls when the solution of the salts becomes supersaturated, and crystallization occurs due to evaporation of the water.

The best and surest way to prevent this undesirable appearance is to construct permanently waterproof building walls. The history of mortars, and recent authoritative tests, both show conclusively that masonry walls sufficiently waterproof to prevent efflorescence are obtained only through the use of mortars rich in lime.

Full details on this important subject will be found in our new booklet, "Mortars and Masonry." Write for your copy.

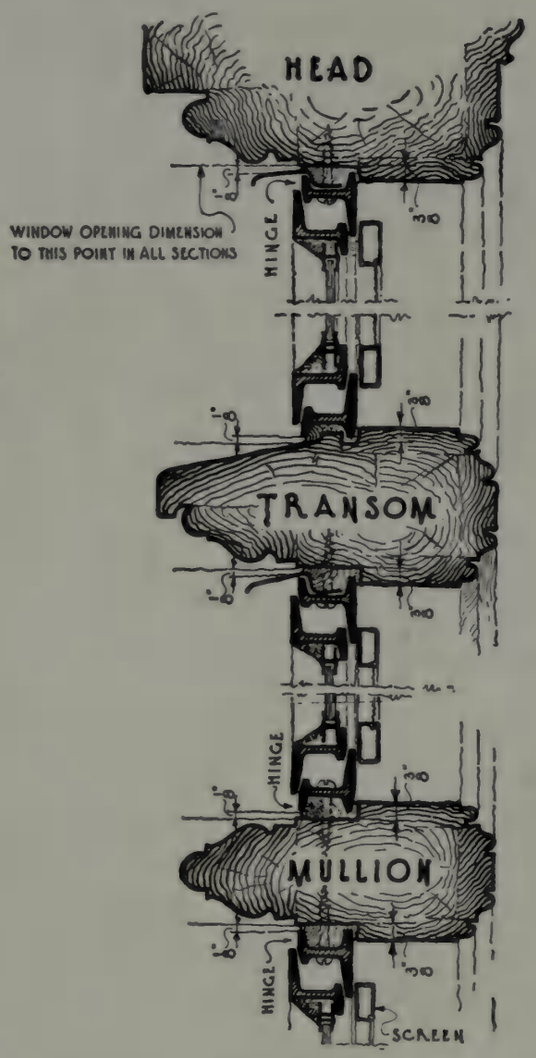
NATIONAL LIME ASSOCIATION

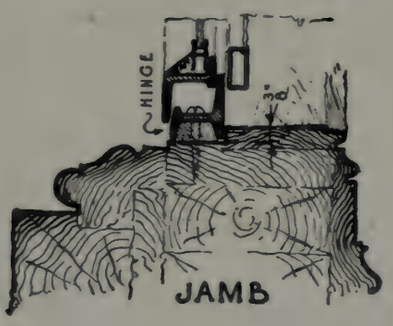
An organization of leading lime manufacturers formed to encourage a better appreciation of the economic value of lime in all its uses.

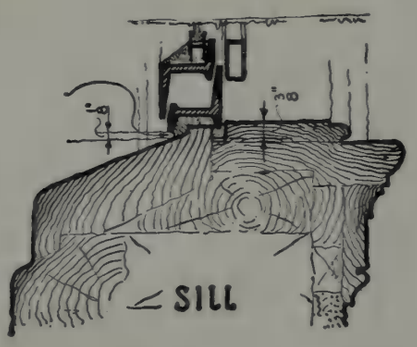
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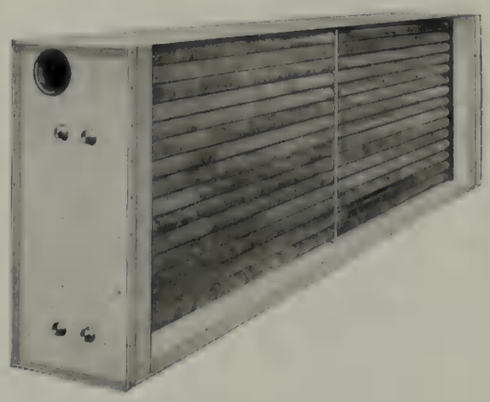
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New office building of the S. S. Kresge Co., Detroit

Why ENCASED ARCOBLAST was selected for this new building...

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ANOTHER modern building has selected modern ventilating equipment—Encased Arcoblast Heaters. The unusual design of Encased Arcoblast gives exclusive advantages. Its light weight makes it possible to install in almost any kind of building, and its design —¾ inch copper tubes with spirally wound fins secured into specially shaped cast iron headers—gives good thermostatic control. The galvanized encasement is complete and ready for pipe connections. There are no soldered steam backed joints—it is built for steam pressure, from 5 to 200 pounds.

* * *

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Especially adapted for Oil Burners



It is now common knowledge that Oil or Gas Burners, as compared to coal fires, require more efficient boilers for economical operation.

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For complete information write for a free copy of our booklet, "The Smith 16". Address: The H. B. Smith Co., Dept. E-51, Westfield, Mass.

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Sugarman & Berger, Architects

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31 STATE STREET BOSTON, MASS.

H. H. Sherman, *Secretary*

GRANITE

A PREVIEW OF THE AUGUST ISSUE

The University Bridge at Philadelphia

As a bridge designer the architect invades what has been almost exclusively the province of the structural engineer, a field that is primarily utilitarian and with requirements that are entirely different from those of buildings. In this bridge the designer, Paul P. Cret, architect, gives his interpretation of bridge design as an architectural problem.

•

A Compact Loft Building

This building by Victor Mayper, architect, may be taken as the typical solution of the loft building. It is subdivided with a minimum waste of cargo space, and utilities occupy a minimum of floor space.

•

Notes on Drafting and Design

Constantly new ideas in design and time saving methods of producing drawings are being developed. In this issue we are illustrating various "kinks" in the design of banks which certain bank design specialists discovered by years of experimentation. We also include information on the design of doors in domestic and public buildings, and a discussion of ways to place windows so as to attain the maximum of light.

•

How Small a House?

The minimal house—the dwelling unit which will satisfy on a minimum of floor space the maximum requirements of a modern household—was the chief topic of discussion at the Frankfort Congress of Modern Architecture. Among the solutions submitted was this scheme by Le Corbusier and P. Jeanneret of Paris, outstanding because of its efficiency in combining the functions of rooms so that they serve one purpose by day and another by night. It offers a pertinent application to the planning of American apartments.

Week-End Houses and Sports Cottages

The increasing popularity of the summer camp, the week-end house and the sports cottage means more than a sentimental "back to nature" fad. They enable the city dweller to preserve the direct contact with nature that is a necessary condition for a sound society. This study of the vacation house, by Mr. K. Lönberg-Holm, presents the most recent data on the design and construction of the shelter.

•

In addition to a portfolio featuring views and layouts of various architectural offices, there will be published photographs and descriptions of new projects and buildings. Among these are the First Baptist Church of Asheville, N. C., by Douglas D. Ellington, architect, and a country house at Johnstown, Pa., by Frank Forster, architect.



Photo. Rittase

THE UNIVERSITY BRIDGE AT PHILADELPHIA

PAUL P. CRET, ARCHITECT

THE ARCHITECTURAL RECORD



DETAIL FROM PRELIMINARY SKETCH
APARTMENT IN CHICAGO
BOWMAN BROS., ARCHITECTS

FEATURES OF THIS ISSUE

Of technical interest to the architect and which may serve well for reference use on the drafting table, the editors wish also to call attention to these features in this issue:

Notes on Drafting and Design, which include a comprehensive procedure for the design of tubular steel flag poles;

Details of Current Architecture;

The Problem of Making Brick Walls Watertight, prepared by Mr. Stanley Newman, a specialist on this subject, analyzing the causes of leaks and offering recommendations which affect specifications and construction methods;

Theatre Acoustics, Ventilating and Lighting, which brings forth the latest data on these topics and supplements a Technical News study of the theatre appearing in the May issue.

A PIONEER: THE ALL-METAL APARTMENT HOUSE

In the American skyscrapers, brought into existence by the strength of steel, we have seen of late an increasing use of aluminum and stainless steel for the spandrels. The new Chrysler, Empire State, and Hollander Buildings, New York City, have metal spandrels; backed with brick, the metal is decorative rather than functional and the advantages of a thin wall have been offset. Nevertheless, the metal spandrels have been indicative of the trend toward a new construction—they are the transition.

Now, with a rapid stride forward, we come upon a building which will have for the first time in America a construction entirely of metal and glass—an apartment house designed by Bowman Brothers, architects, and shortly to be erected in Chicago. Ground will be broken for the building in October, according to a letter just received from the architects.

The project is presented as the news feature of this issue with a full description of the construction and a complete analysis of its costs and economic importance.

In its economic potentialities, with a cutting down of erection costs, head loss, excess weight and wasted space, and with an increase of rentable floor space, the metal construction promises much for the investor. On a comparatively small ground plot such as this particular apartment house possesses, the increase of rentable floor area may be so proportionally high that the increased return on the equity will induce a hesitating builder to build. Here, it is felt, by pointing out to clients the possibilities of increased income from such construction in metal there is an opportunity for the architect to stimulate his own business.

As a pioneer of the new type the building deserves the attention of the historians. The use of metal construction means the evolution of new designs: obviously the forms that gave character to brick and masonry would be illogical and absurd if translated into metal. New building forms, expressive of the new medium, are inevitable.



A TRUMBULL INSTALLATION

Fidelity-Philadelphia
Trust Company Building,
Philadelphia, Pa.

SIMON & SIMON of
Philadelphia, Architects

Architects may be interested to know that complete "Circle T" Trumbull installations, including Panelboards, Switchboards and Switches of various types, are to be found in thousands of the best buildings erected in all parts of the country. "Circle T" Trumbull engineers gladly cooperate with architects and engineers in suggesting practical layouts. On request, copies of these publications: Safety Switches; Trumbull "Controlite"—Theatre Switchboards; Flex-A-Power—The Convenience Outlet for Power in Industry; Trumbull "Cheer"—A monthly publication of the Trumbull line; our new BUSS-WA Bulletin, on the copper bar system for power and light distribution.

All of the panelboards installed in the Fidelity-Philadelphia Building, with their enclosing steel cabinets, were furnished by the Trumbull Electric Manufacturing Company and sold through the General Electric Company.

Of the eighty panelboards installed for power and lighting, totalling approximately 2,400 circuits, practically the entire amount were of the metering type for lighting distribution. These metering panels were of the so-called meter bar type arranged for 3 phase, 4 wire distribution. Each panel was arranged so that any circuit could be placed on any meter bar without the necessity of making changes in any wiring connections. The metering panels were all of large size, consisting of a meter bar section, a meter loop section and then two meter compartments, one at the right and the other at the left, for housing the various meters.

Fifty-two of these panels were installed, totalling 1,772 circuits. Practically each one of these lighting cabinets measured over six feet square.

See the Trumbull "Circle T" catalogue in the new 4-volume Sweet's, Vol. D, pages 5164-5165.

THE TRUMBULL ELECTRIC MANUFACTURING COMPANY

PLAINVILLE - - - CONNECTICUT

A GENERAL ELECTRIC ORGANIZATION

Branch Panelboard and Switchboard Factory at Ludlow, Kentucky
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803 Lincoln Bldg. NEW YORK
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PHILADELPHIA 511-519 N. Broad St.
ATLANTA
DETROIT 415 Brainard St.
CHICAGO 2001 W. Pershing Rd.
SAN FRANCISCO 432 Fourth St.



The record of four heating seasons shows a consistent FUEL SAVING of 32% *in the* Barry Apartments, Chicago

IN 1926 the vacuum return line heating system of the Barry Apartments was changed over to operate as a Dunham Differential System. From December 1, 1925, to April 30, 1926,* the season prior to the change, fuel cost was $5,733.

Operating records for corresponding periods (December 1 to April 30) during the next four heating seasons under Differential System operation show an average fuel cost per season of $3,885. The average saving per season is over $1,800.

The season just ended (December 1, 1929 to April 30, 1930) again demonstrates the consistent, economical operation of the Differential System. Fuel cost was $3,724.

The Barry Apartment building is only one example of the many change-over installations where Differential System fuel savings quickly pay their cost and then go on returning consistent, large dividends year after year.

Find out what Dunham Differential System fuel economy means to you in dollars and cents. Dunham engineers will survey your present system and give you reliable estimates of the operating economies possible.

Many existing heating systems can be converted to Differential operation at moderate cost. Arrangements may be made for funding the cost of change-over to Differential heating. The fuel savings meet the payments required. Dunham engineers will survey present systems without obligation.

» » » »

**Records are not available for the 1925-26 season prior to December 1, 1925. The figures for the following years are for the same periods, December 1 to April 30, so as to secure a direct comparison of fuel cost.*



Look for the name DUNHAM. This name-plate identifies a genuine Dunham Thermostatic Radiator Trap

C. A. DUNHAM CO.

450 East Ohio Street *Dunham Building* Chicago, Illinois

Over 80 branch offices in the United States, Canada and the United Kingdom bring Dunham Service as close to you as your telephone. Consult the 58-page Dunham Architectural Handbook in Sweets—Volume D. Dunham engineers are at your service with complete and authoritative data on improved heating practice.



STRINGING THE CABLES ON THE NEW HUDSON RIVER BRIDGE

THE ARCHITECTURAL RECORD

AN ILLUSTRATED MONTHLY MAGAZINE OF
ARCHITECTURE & THE ALLIED
ARTS & CRAFTS

VOLUME 68 JULY • 1930 NUMBER 1

THE FIRST ALL-METAL APARTMENT HOUSE

LAKE FRONT BUILDING, CHICAGO
BOWMAN BROTHERS, INC., ARCHITECTS

INCREASED RENTABLE AREA—INCREASED PROFIT TO OWNER

A PROBLEM OF RENTABLE AREA

To build an apartment house which will have the maximum usable floor area and number of floors compatible with livability, economy and the building code.

A SOLUTION IN METAL CONSTRUCTION

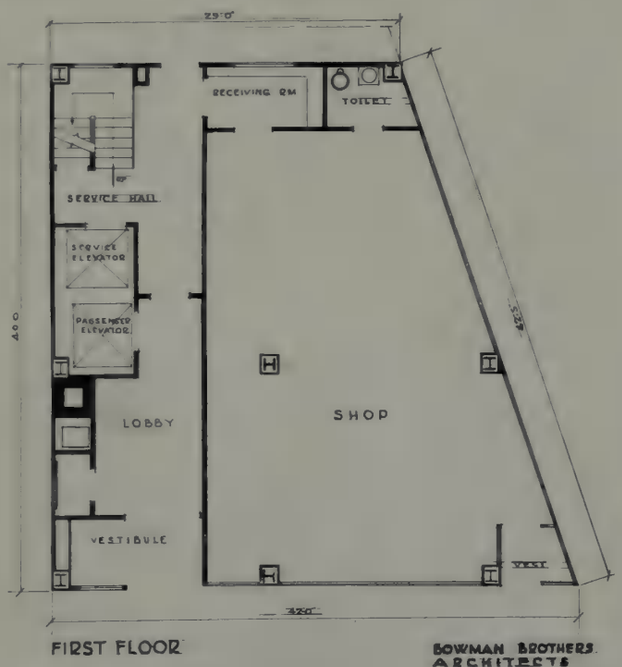
Insulated metal walls which increase the net floor area, decrease the heat loss and cost less than masonry; battledeck floors which permit the addition of another floor and still keep within the height limit of the zoning ordinance. The reduction in heat loss through insulated walls and double windows and savings in construction cost permit the inclusion of such additional features as electric heat and other special equipment.

METAL WALLS

In order to increase the usable floor area, decrease the dead load of the walls, increase the heat insulation value of the ex-

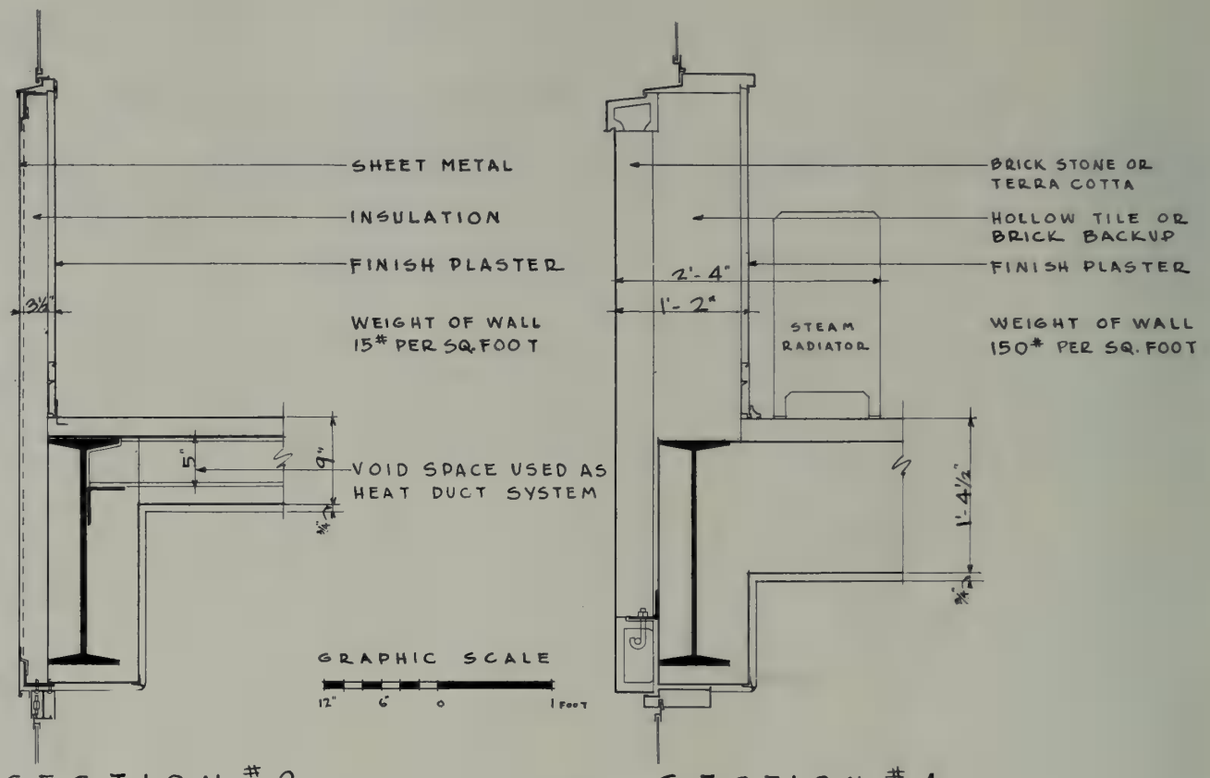


TYPICAL FLOOR



FIRST FLOOR

BOWMAN BROTHERS
ARCHITECTS



SECTION # 2
FIREPROOF SPANDREL
WALL CONSTRUCTION
IN BOWMAN BROTHERS PRACTICE

SECTION # 1
FIREPROOF SPANDREL
WALL CONSTRUCTION
IN CURRENT PRACTICE

METAL WALL INCREASES NET FLOOR AREA

terior wall, eliminate trouble from leaking walls and at the same time reduce the first cost of the building, the wall shown in the accompanying drawings was developed.

A. SPACE SAVED

Section No. 1 shows the old type of masonry wall construction occupying 14" of space along the perimeter of the building. Section No. 2 shows the new type of metal wall construction which occupies only 3½" of the space along the perimeter of the building.

AREAS FOR LAKE FRONT BUILDING

Areas	*Masonry Walls*	*Metal Walls*
Non-Rentable Area*		
Ext. Walls.....	179 sq. ft.	44 sq. ft.
Balance.....	276 sq. ft.	276 sq. ft.
Net Rentable.....	965 sq. ft.	1100 sq. ft.
Gross.....	1420 sq. ft.	1420 sq. ft.

* Non-rentable includes elevators, stairs, public halls, chimneys, air ducts, columns, partitions and exterior brick walls.

The savings** through using metal walls is 135 square feet or 14% of the net rentable area if it were built with brick walls.

B. INCREASED INCOME

A decrease in the thickness of the exterior walls of a building means an increase in floor area. In the case of a building with a comparatively small ground area this increase will be a large percentage of the net rentable floor area, which will represent a greater return to the owner in inverse ratio to his equity. The larger the plan area the less will be the percentage of increased return on the equity.

Applying this method to an office building of same area and shape renting at $4 a square foot, the rent with the masonry walls would be $3,860 a year whereas with metal walls the rent would be $4,400, an

** Brick Wall 1'-2" x 153' = 179 sq. ft.
Metal Wall 3½" x 153' = 44 sq. ft.
Saving 135 sq. ft.

increase of $540 or 14% on the gross income for each floor. As a matter of fact the metal walls will cost less as shown later.

This increase of 14% in the income of the entire building will represent an additional net income on the equity of 56%, if the equity is assumed at one-fourth of the total cost of the project.

This is an exceptional case; in the ordinary office building the increase in net rentable floor area for a larger ground plot would not ordinarily exceed 3%. This would represent an additional net income on the equity of approximately 12%, assuming that the equity is 25% of the total project cost.

C. WALL CONSTRUCTION

An analysis was made of different types of metal walls including:

I. A wall built of sheet aluminum with aluminum framework within, waterproofed and insulated, etc.;

II. A wall built of sheet aluminum with steel framework within, waterproofed and insulated, etc.;

III. A wall built of Allegheny Metal "KA2" (not to be confused with stainless steel "Ascoloy" which is the name given to chromium steels without a nickel content).

A wall built of "Ascoloy" sheets with steel framework within, waterproofed and insulated, was discarded because of the cost of the necessary maintenance. Steel sheet was also considered instead of "Ascoloy" but was discarded because of the cost of necessary maintenance.

Other metals were also included but are not interesting because of their high cost or lack of practicability.

In each case these metal walls were designed as slabs where the live load was represented by the wind load. The thickness of the metals was varied according to respective tensile strengths and designed by the deflection formula. A large factor of safety was allowed to take care of intangible items, such as vibration and shivering under a high wind, denting, etc.

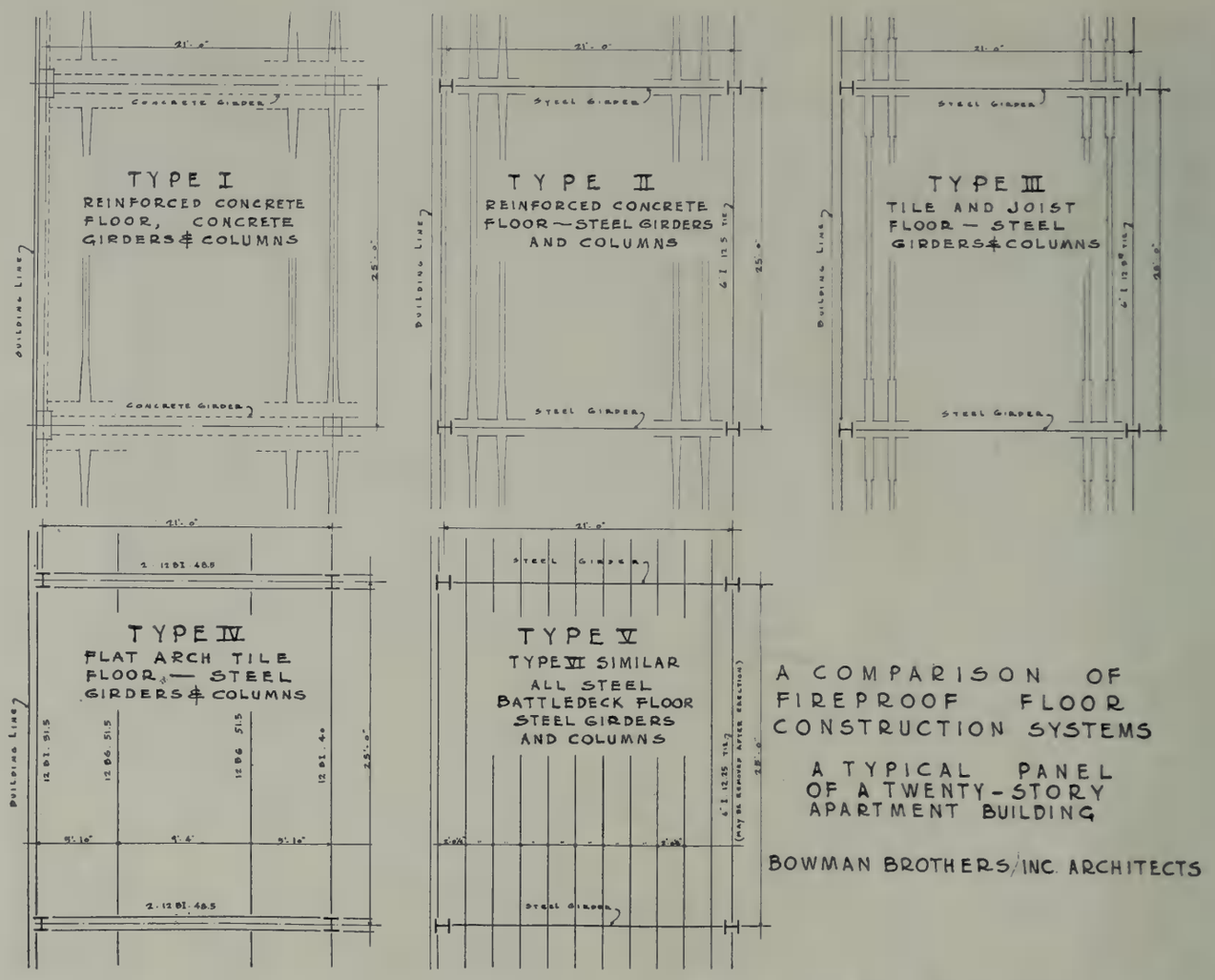


MODEL OF ALL METAL APARTMENT HOUSE
BOWMAN BROTHERS, ARCHITECTS

The method of fastening was a problem. Riveting the sheets was discarded as impractical, due to the difficulty of matching holes in sheets to holes in the framework of the wall. Welding was also discarded as being too costly and actually not necessary. The method which proved to be the most practical from the standpoint of good construction and economy and erection time was clamping the sheets to the framework with straps, all edges having been formed in the shop to permit lock-seaming.

Allegheny metal, which was selected for the wall, does not require paint or maintenance of any kind for at least thirty years. This wall will cost for metal in place approximately $1.20 a square foot, plus $.16 for insulation, plus $.17 for metal lath and plaster, or a total of approximately $1.53 a square foot of wall surface which is less than masonry wall ($2.17 a square foot) with waterproofing, furring, lath and plaster.

It must be kept in mind that the above described metal wall is equivalent to a 36"



brick wall in heat insulation value and if the cost of a 36″ brick wall (stone facing) were compared with the above metal wall a still greater difference would be apparent. Or by adding the cost of 2″ of insulation to the 12″ stone wall with brick backup, a fair comparison would be made.

The time saving effected by the use of a metal wall is considerable and must be taken into account. Furthermore, the maintenance of stone walls (tuck-pointing, cleaning, etc.) is costly, whereas the metal wall requires none.

D. INSULATION

The metal wall is to be backed with 3″ slabs of rock wool. This material should not be confused with mineral wool which will compress under vibration, or blocks composed of mineral wool held together by asphalt compounds which will disintegrate or settle under heat and jarring. Rock wool will not disintegrate or settle at any temperature between 40 degrees below zero to 1,250 degrees Fahrenheit. Its coefficient of conductivity is .27 B.t.u.* (approximately the same as cork board) and it weighs 12 pounds a cubic foot. The overall conductivity of the wall with metal face, 3″ of rock wool and interior plaster, will be approximately .09 B.t.u. an hour per square foot. This is roughly equivalent to a brick wall 36″ thick.

FLOOR CONSTRUCTION

An analysis was made to find the best type of floor, giving consideration to cost, space occupied, length of time required for construction, and sound insulating factors.

COSTS

To arrive at accurate floor construction costs, the architects, in cooperation with

* A.S.H.V.E. Guide 1930. Page 23.

engineers, designed one panel of a building in six different types of construction. The types were as follows:

•

Type I. Reinforced concrete floor, girders and columns. (10 plus 2½, 6″ joists at 36″ cts., widened to 10″ at ends. Plaster ceiling included.) The cost of this system was only $1.17 a square foot but its dead load weight of 64 lbs. required columns of excessive size and for this reason was discarded as being impractical.

•

Type II. Reinforced concrete floor, steel girders and columns. (10 plus 2½, 5″ joists at 25″ cts. widened to 9″ at ends and plaster ceiling included.) The cost of this system was $1.33 a square foot. Dead load weight was 68 lbs. a square foot. The columns for this type of floor were 14″ BH-236 lbs. at the ground floor and cost $.412 a square foot, totaling $1.74 a square foot complete.

•

Type III. Tile and joist floor, steel girders and columns. (10 plus 2, 4″ joists at 20″ cts., 10″ tile fillers widened to 8″ at ends by using 12″ tile. Plaster ceiling included.) The cost of this system was $1.39 a square foot. Its dead load weight being 79 lbs. a square foot, the columns thereby were increased in weight. No saving could be effected over *Type* II.

•

Type IV. Flat arch tile floor, steel girders and columns. (14″ flat arch tile, 2″ concrete top. Plaster ceiling included.) The cost of this system was $1.38 a square foot. Its dead load weight being 74 lbs. a square foot, the columns thereby were increased in weight. No saving could be effected over *Type* II.

•

Type V. All steel battledeck floor, steel girders and columns. (5″ I-beams 14.75 lbs. 24 x 3/16″ plates. 2″ tile fireproofing. Plaster ceiling included. Spandrel wall with brick facing, hollow tile backup, T.C. sills and head.) The cost of this system was $1.35 a square foot. Its dead load being reduced to 42½ lbs. a square foot, the columns thereby were reduced in cost to $.289 a square foot, totaling $1.64 a square foot complete.

•

Type VI. All steel battledeck floor, steel girders and columns. (5″ I-beams 12.25 lbs. 24″ x 3/16″ plates. 2″ tile fireproofing. Plaster ceiling included. Spandrel wall of metal filled with mineral wool.) This construction is the same as *Type* V except in the spandrel wall weight. Its cost per square foot for the floors was $1.32 and for the columns was $.254, totaling $1.57 a square foot complete. Saving over *Type* II was $.17 a square foot.

Note: In the above outline no finish flooring was included. As there is such a great variety of finish flooring available, a separate analysis was made, the schedule for which accompanies this article.

•

SPACE GAINED

For a 25′ span the floor thickness of battledeck steel floor system is 9″ (including finish floor) as compared with 16½″ (including finish floor) if the flat tile arch construction were used. In the Lake Front Building this means that where twenty stories are now permitted under the present zoning ordinance, twenty-one and one-half stories of the same clear ceiling height can be built within the same volume.

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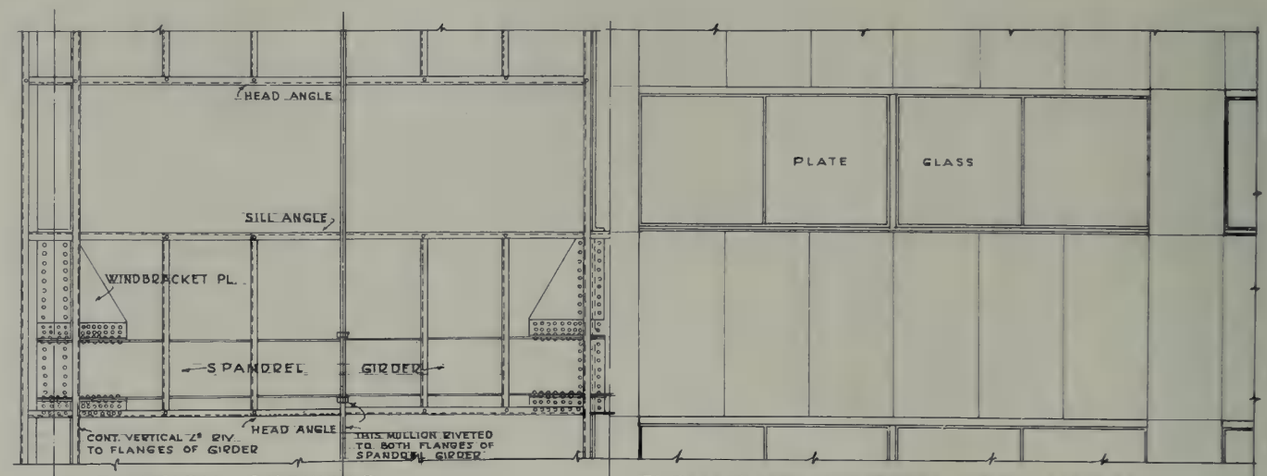
ADVANTAGES OF METAL WALL AND FLOOR CONSTRUCTION

The outstanding advantages of these two methods when combined are the increase in usable volume, decrease in cost and speeding up of erection time. The latter feature, the saving in time required for erection, is of considerable importance in some buildings.

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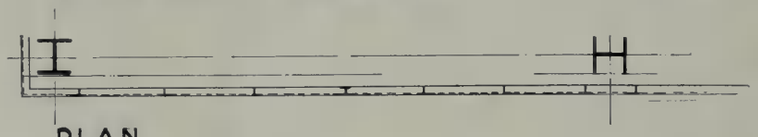
CONSTRUCTION TIME SAVING

The metal building is like a large Meccano set, fabricated almost entirely in the steel mills where the work done on it can be accomplished in a much more efficient manner because of the availability of rig-



ELEVATION SHOWING STRUCTURAL FRAMEWORK

ELEVATION SHOWING SHEET METAL SIDING COVERING FRAMEWORK



PLAN

STRUCTURAL DETAILS

ging for punching, riveting, welding and other fabricating operations.

Where the battledeck floor is used, it can be built of plates and I-beams on 2′ centers in such a way that three or four widths of plates may be shop-welded to the I-beam joists which support them and delivered to the job in sections with two-thirds of the welding already done. This would effect a cost saving in the welding and a time saving in the erection.

Where a metal floor system is used consisting of I-beam joists with Holorib, Mahon, Truscon or other steel roof decking inverted and laid on the top of the joists and filled with terrazzo, a still greater saving in cost of material and welding is effected as well as a great saving in erection time.

Time savings in construction are of primary importance because during the entire time that a building is under construction capital must be at hand, ready to be paid out and yet not a cent can be taken in. A building taking a year to build using the old methods of so-called fireproof construction would take from eight to nine months to construct entirely in metal. This means that the money invested is idle for only 65% to 75% of the time that it has been idle heretofore.

SPECIAL FEATURES IN BUILDING

Electric Heating

Since the wall construction is insulated to such a high degree, the loss of heat through the wall is reduced to just one-third of the normal loss. Since the windows are double-glazed, the loss of heat through them is reduced to one-half of the normal loss.

The average heat loss through wall and window is thereby reduced to approximately 41% of the heat loss which exists in popular fireproof construction.

These drastic reductions in heat losses make the use of electric heat possible. Also consider the fact that since so much electricity is consumed by this building in operating radiators, ventilating equipment, elevators, refrigerators, ranges, dish washers, clothes driers, general lighting, etc., the public utilities can furnish power at a reduced rate.

The architects have found a means of heating the apartments in such a way that the air will not be scorched and the moisture evaporated as it is in the average steam heated apartment of today.

Due to mechanical circulation of the air across the heating elements by means of fans, the air in the room is constantly in motion which means that the difference in

temperature from floor line to ceiling line will be only two degrees resulting in a comfort heretofore impossible with any other means of direct radiation.

■

Interiors

All interiors are treated in the most modern manner without being tricky or faddish, "modern" being interpreted as the simplest way to obtain an end.

All rooms in this building are indirectly lighted, giving an even glow of perfectly shadowless light.

■

Kitchens

All kitchens will be equipped with mechanical ventilation, electric ranges, electric refrigerators and electric dish washers. The cabinet work being entirely in metal is vermin proof and cannot warp or shrink.

■

Bathrooms

The bathrooms will have large sunken tubs enclosed in plate glass; special lavatory built entirely of metal; dressing table; mechanical ventilation as well as two large windows; built-in towel cabinets, medicine cabinets, etc.

■

Lobby and Vestibule

The building lobby and vestibule will be wainscoted with marble from floor to ceiling. The floors are of terrazzo and the ceiling silver-leafed. The lighting fixtures are executed very simply in pewter.

■

Elevators

The elevators are of high speed type, the cabs being leather covered; the elevator controls are entirely automatic, but uniformed operators will be always on duty.

■

Radio Facilities

It has been claimed that radio reception in an all-metal building would be impossible. This is not true of this building, owing to the fact that one aerial is installed on the roof and one centralized radio is located in the elevator penthouse. This radio set is so designed that it can be operated by remote control from any apartment in the building in such a way that each tenant may select any station on the dial without interference from any other apartment, even though they are all receiving from different stations.

In each apartment there will be a loud speaker installed in a flush panel with one volume dial and one tuning dial only. The mechanism installed in each apartment is so designed that no amateur mechanic can remove any parts or tamper with any adjustment. Extensions may be made from the loud speaker to any other room in which a loud speaker is desired, similar to telephone extensions.

The fact that the building is constructed of metal walls assists in shielding the radio sets within its walls from interference of outside disturbances.

■

Lightning Safety

Making an object lightning-safe requires its proper "grounding." The walls being constructed of metal and connected to the ground, any electrical charge which might accumulate on its face by induction, as from a passing cloud, will be conducted immediately to the earth.

ROBERT L. DAVISON.

COST SCHEDULE OF FINISHED FLOORING FOR BATTLEDECK CONSTRUCTION

MATERIAL	SIZE	UNDER BED	ADDITIONAL FIREPROOFING REQUIRED	OVERALL THICKNESS	TOTAL COST PER SQ. FT.
QUARRY TILE	1" THICK 9"x9" SQ.	1½" CEM. GROUT	NONE	2½"	85¢
RED	⅜" THICK 6"x6" SQ.	"	"	2⅛"	75¢
QUARRY TILE	1" THICK 9"x9" SQ.	"	"	2½"	95¢
BROWN	⅜" THICK 6"x6" SQ.	"	"	2⅛"	85¢
ART MARBLE (DOTTICINO)	1" THICK 12"x12" SQ.	"	"	2½"	85¢
TERRAZZO	¾" MARBLE CHIPS BRASS STRIPS 24"O.C.	1¼" "	"	2"	40¢
*MOULSTONE	½" THICK WEARING SURF.		2" CEMENT SLAB SIDEWALK FINISH	2½"	36¢
MASTIC (100% ELATERITE)	3/16 THICK WEARING SURF.		"	2¼"	42¢
LINOLEUM	¼" BATTLESHIP		"	2¼"	46¢
CORK	⅛" THICK		"	2⅛"	60¢
RUBBER TILE	⅛ THICK		"	2⅛"	71¢
*OAK #1 RED	⅞" THICK 12" PARQUET SQUARES		"	3"	75¢
*OAK #1 RED	⅞" THICK 2½" STRIP FLOORING		2" CEMENT SLAB ROUGH	3½"	66¢
CARPET COMMERCIAL GRADE	ABT ¼" THICK	½" OZITE	2" CEMENT SLAB SIDEWALK FINISH	2¾"	110¢

* A FORM OF HARDENED MASTIC

The August issue of THE ARCHITECTURAL RECORD will contain a Technical News study on qualities of various metals for exterior use.

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS

LOCATION

Situated at the center of Chicago's financial district on the site of the old Chamber of Commerce Building. It is immediately opposite the City Hall and County Building.

•

LAYOUT

The entrance to first floor banking room extends the entire 30-foot width of the lobby, which obtains a direct thoroughfare from La Salle Street to Clark Street through the bank building and the adjoining building. The ceiling height is 14 feet in the clear.



FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS

Commercial banking room extends almost the entire length of the building and is 167 feet long, 57 feet wide, and 36 feet high.

The Foreman State National Bank, the Foreman State Trust and Savings Bank, and the Foreman State Corporation Investment Affiliates occupy nine floors of the building, with two separate elevators which serve the bank premises exclusively. Above the banking floors are offices.

On the sixth and seventh floors are located the investment and trust departments. The directors' room, private dining room and kitchen are located on the 38th floor. The usual type of directors' room with its long table and stiff chairs has been replaced by a room where the bank officers may lounge after their luncheon.

Vault chambers occupy the entire basement. There is a capacity of 35,000 boxes, 95 coupon booths, and 11 conference rooms. A spacious ladies' lounging room is provided on this floor for those women who wish to rest or who have made an appointment to meet friends.

•

MATERIALS

Lower six stories faced with Ausable polished granite; Indiana limestone veneer upper 36 stories; walls of lobby and main banking room: Tavernelle Claire marble slabs; floors of lobby and bank: Tennessee marble; office corridors are in Botticino marble with Tennessee marble floors.



OFFICERS' DESKS



Photos. Chicago Architectural Photographing Co.

LOUNGING ROOM

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS



Photo. Chicago Architectural Photographing Co.

OFFICERS' SPACE

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS

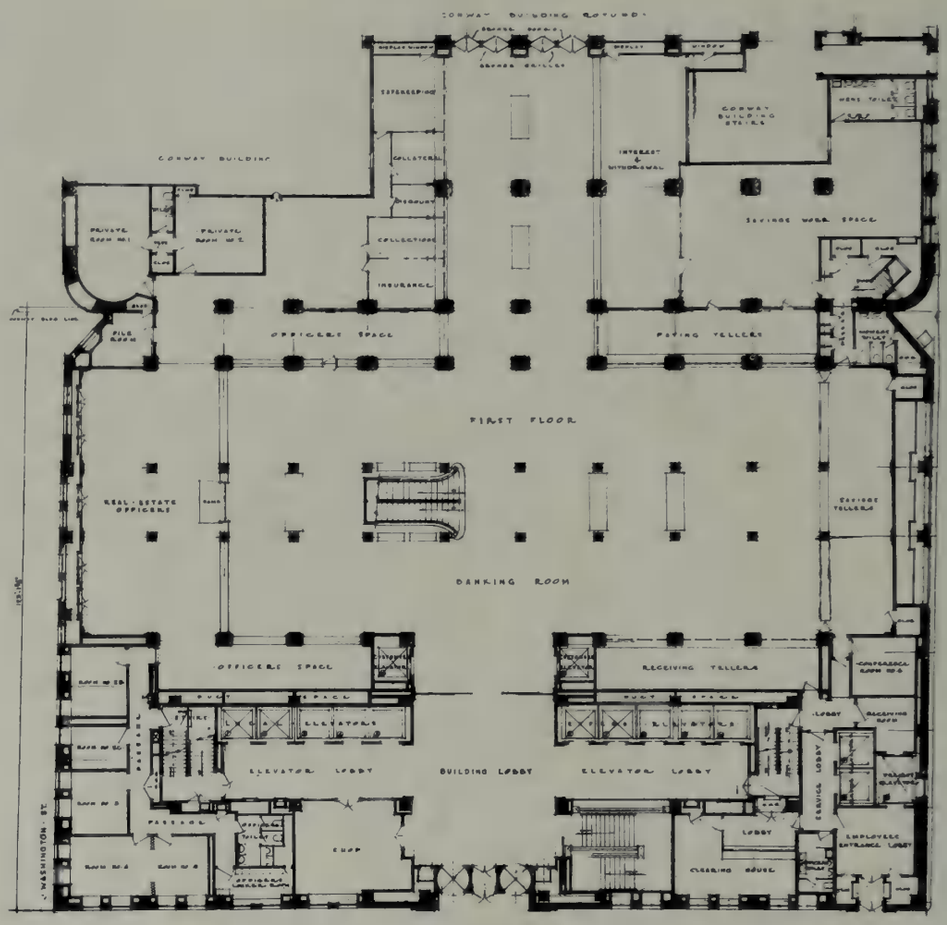


Photo. Chicago Architectural Photographing Co.

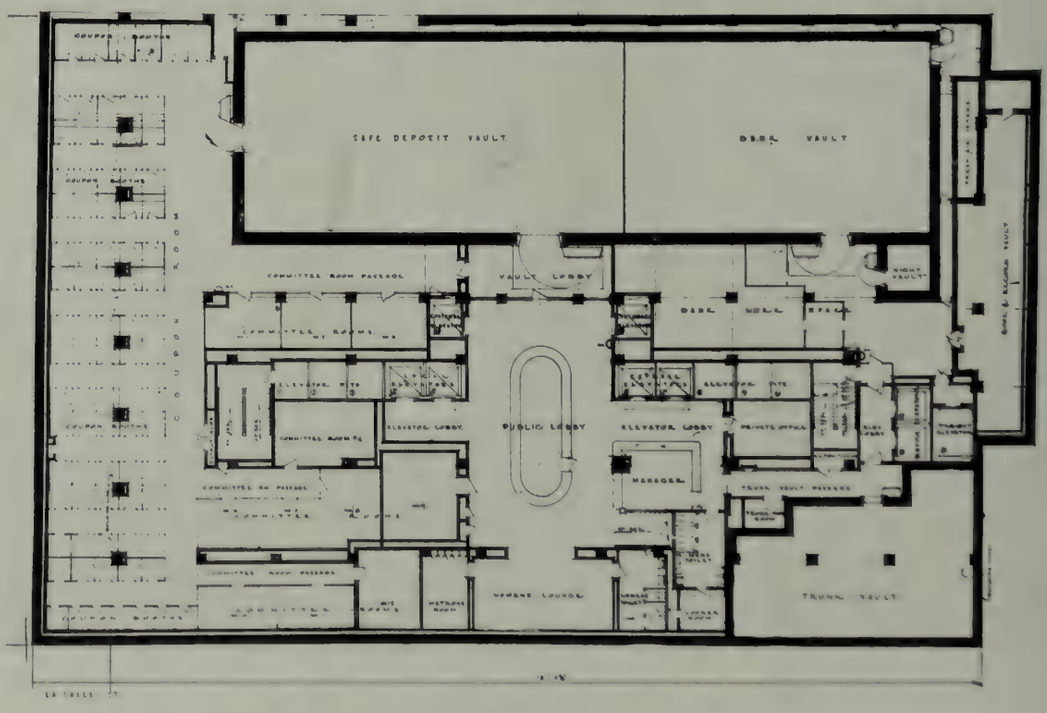
COMMERCIAL BANK ROOM

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS



GROUND FLOOR PLAN



BASEMENT PLAN

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS

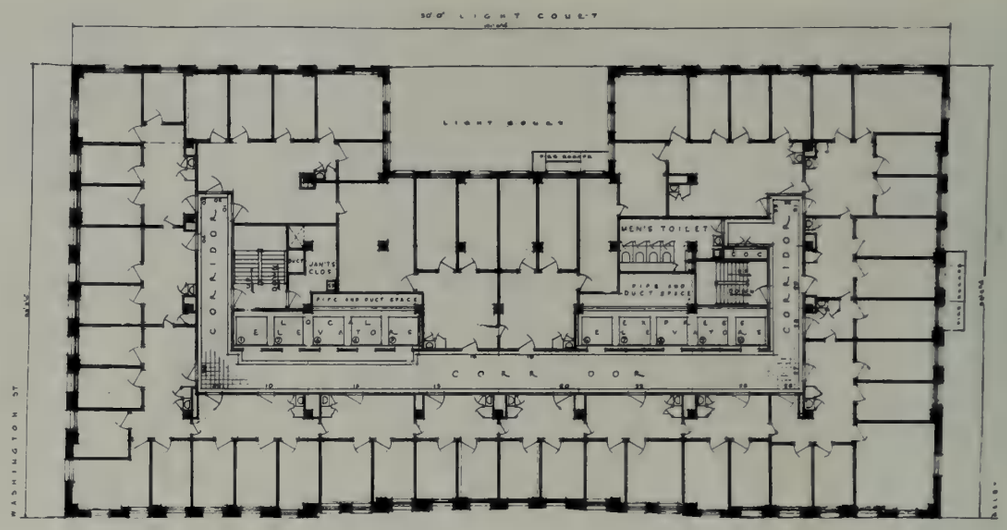


Photo. Chicago Architectural Photographing Co.

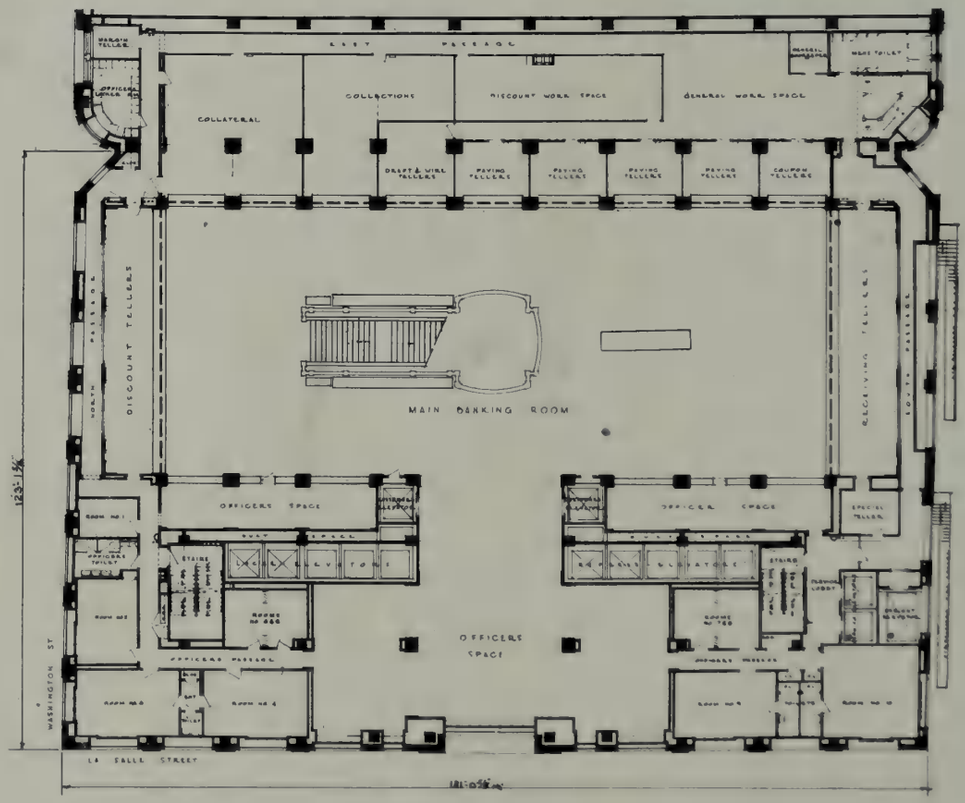
ENTRANCE STAIRS LEADING TO BANKING ROOM

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS



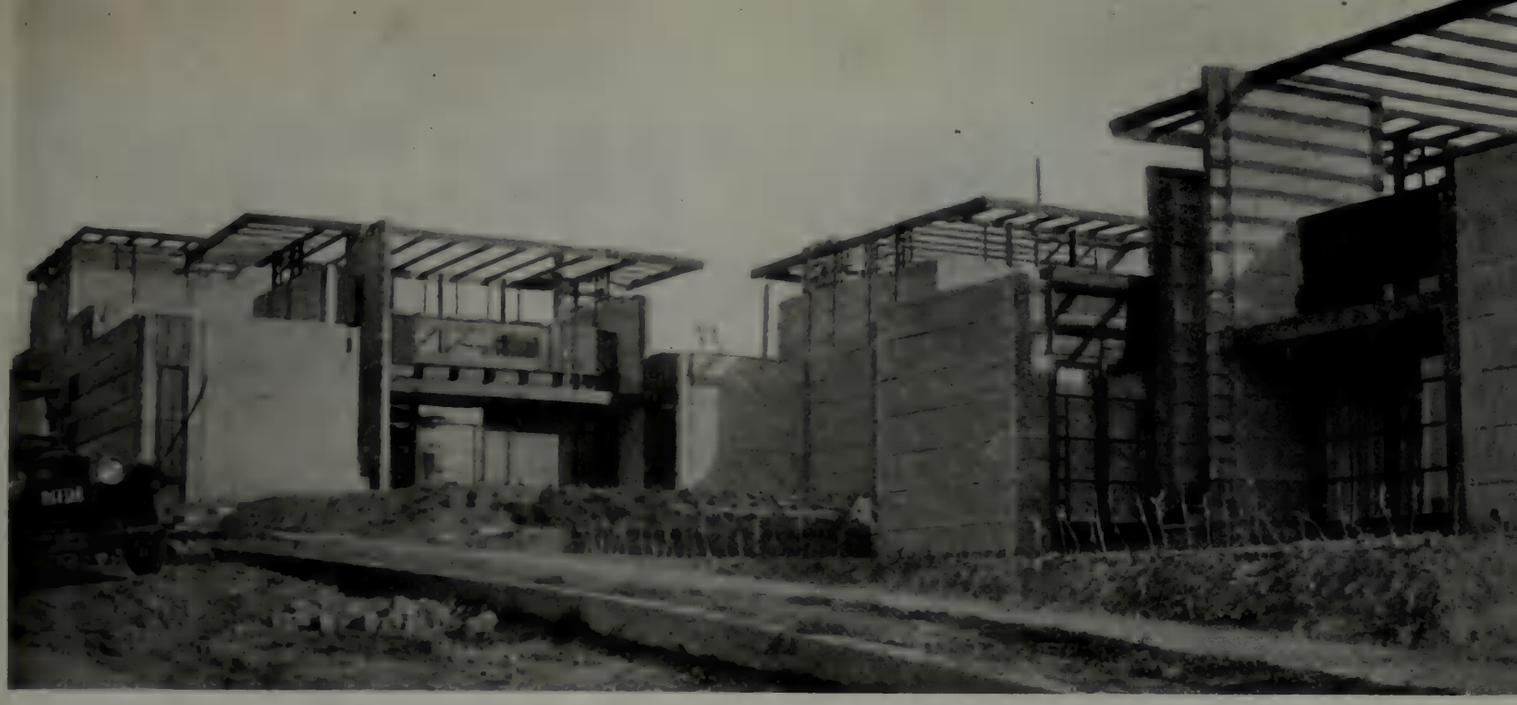
TYPICAL FLOOR PLAN



SECOND FLOOR PLAN

FOREMAN STATE NATIONAL BANK BUILDING, CHICAGO

GRAHAM, ANDERSON, PROBST AND WHITE, ARCHITECTS



HOUSES FOR OUTDOOR LIFE

A Vacation Settlement on the Pueblo Ribera, La Jolla, California

R. M. SCHINDLER, ARCHITECT

THE LOCATION

A sloping piece of ground close to the shores of the Pacific Ocean, on the southern end of La Jolla, facing two parallel streets and bisected by a public alley.

THE PROGRAM

Dr. W. L. Lloyd decided to build a group of twelve houses including garages for rental to summer vacationists. The utmost economy was necessary to meet the competition of the customary primitive wooden beach shack.

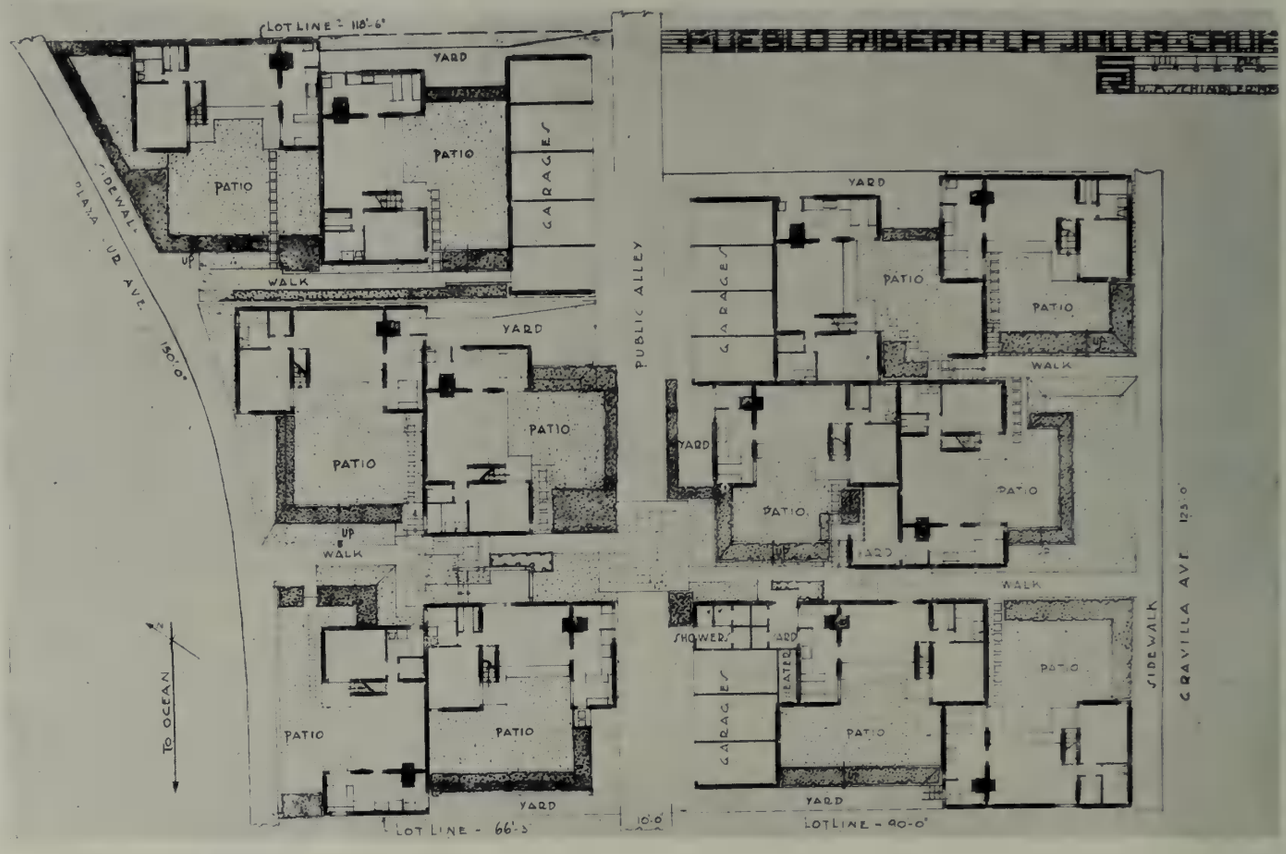
THE LAYOUT

In order to facilitate extensive outdoor life a play court for each house was considered necessary. The single house unit is repeated twelve times. The units are arranged to give complete privacy to the play courts in front of the living rooms. In no case do a neighbor's windows open into a court. Each house has a roof terrace surrounded by a parapet of sufficient height to assure privacy. Each roof terrace is equipped with a fireplace and looks freely out toward the ocean. The garages are accessible from the public alley. A central gas heater and circulating system provide hot water for all dwellings. A group of public showers serve the bathers returning from the beach.

The court side of each living room is formed by sliding glass doors which may be opened full length. High windows on the other side of the room open out above the lower side portions of the house. Their location right below the ceiling insures ample light and ventilation and serves to counteract the effects of the sun on the roof terrace. Each living room has a real fireplace; a couch and a closet permit its use as a guest room. Each kitchen is equipped with an icebox and a garbage incinerator.

STRUCTURAL SCHEME

All floors are made of concrete and laid right on the ground. The roofs are constructed of wood joists covered with shiplap and composition roofing. The roof terrace is formed by a concrete slab laid on top of the roofing. All walls are made of concrete by a "slab-cast" scheme. It is a



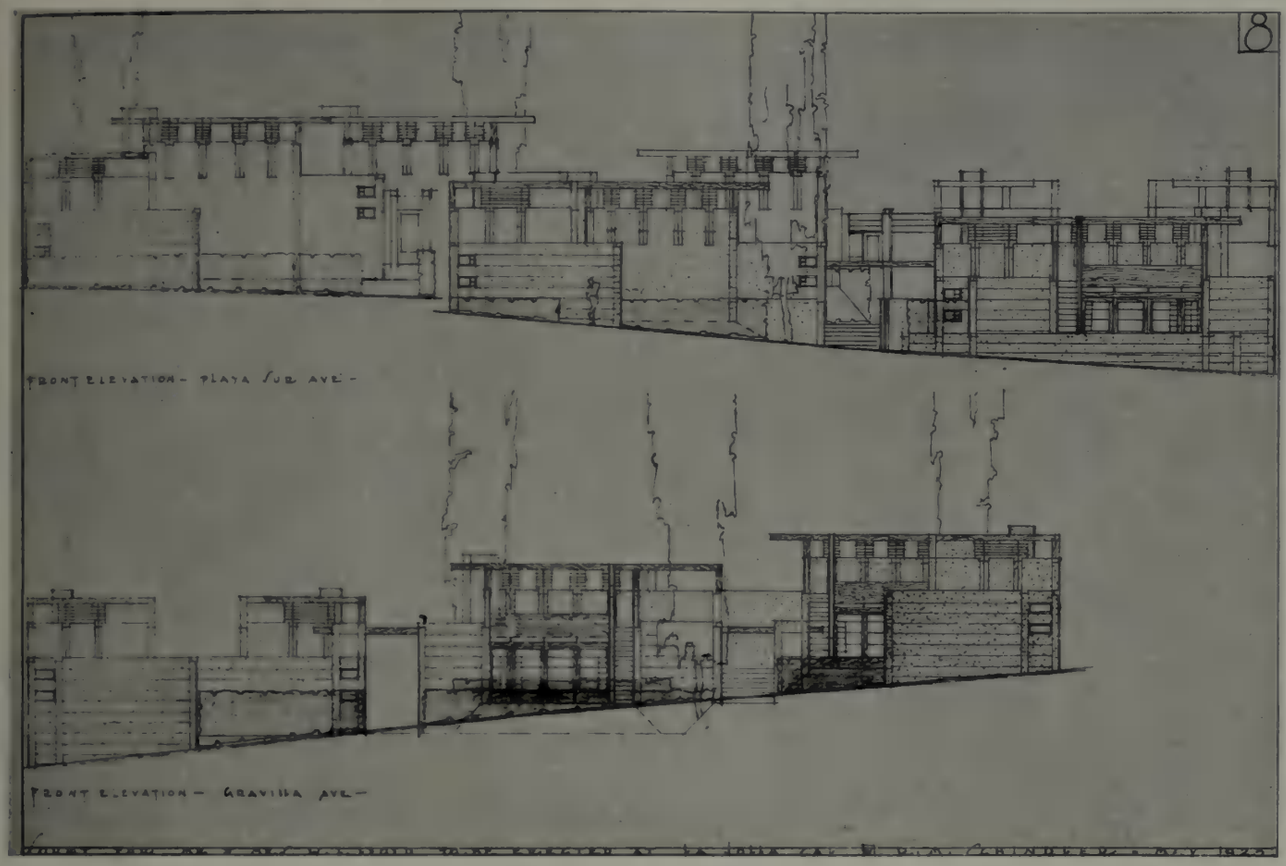
PLOT PLAN OF DEVELOPMENT
PUEBLO RIBERA, LA JOLLA, CALIFORNIA
R. M. SCHINDLER, ARCHITECT

type of monolithic concrete wall construction suitable for one- and two-story buildings. In climates colder than California some added provision for heat insulation should be made.

The "slab-cast" form work is made of wood and consists of a skeleton of vertical guides and a single continuous course of horizontal wall forms. The guides are two inches thick and have bevelled edges to help the stripping. The wall forms slide on the outside of the guides. They are made of two-inch boards held together by cleats. The inside is covered with roofing paper in order to insure a good surface for the concrete. A small triangular wood strip holds the paper in place and gives a clean cut seam for each course of concrete. The forms are pressed against the guides by means of the cleats and iron clamps.

The concrete floor is placed and finished first. The guides are then erected. Next the window and door frames, anchors, reinforcing rods including special ties at corners, plumbing pipes, etc., are placed between the forms. No cutting of formwork is necessary. One course of concrete is poured each day. The concrete is poured during the afternoon, allowing it to set overnight sufficiently to permit the raising of the forms the next morning. The forms are loosened by opening the clamps and then they are slid up to the next course. Long heavy form units are handled by means of block and tackle fastened to the cross braces on top of the guides.

The concrete used need be only of low strength (500 lbs.). Often suitable aggregate for such concrete is found right on the premises. The form lumber, being two inches thick, is not damaged and so is available for structural purposes. Two sets of forms only were used for the Pueblo Ribera. After forms are once made, unskilled labor



WORKING DRAWINGS
PUEBLO RIBERA, LA JOLLA, CALIFORNIA
R. M. SCHINDLER, ARCHITECT

is sufficient for the handling. No plastering of walls is required either inside or outside.

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ARCHITECTURAL DESIGN

An attempt was made to achieve an organic whole out of the aggregation of small units. The grouping serves to overcome the appearance of a mechanical repetition of units so frequent in similar schemes. Each house receives an individual character through its position in relation to its neighbor and through variations in the design of the woodwork above the openings and in the roof pergola. The neighbor's windowless back walls become attractive garden features. Roof terrace, play court and living room join to form one living space. A uniform scale is maintained throughout by using a scheme of equally spaced unit lines for the whole layout.

Each house is apparently formed by a series of upright slab units. The slab units used to form the enclosure are made of concrete, and those used to screen the openings are composed of wood and glass. All these slab units are joined by recessed links, which result from the use of the form guides. The small horizontal grooves between the courses of the wall do not appear on the links and do not contradict the monolithic character of the slab unit. Architecturally the recessed links are as characteristic of the modern slab wall as the plaster was of the traditional plastic masonry wall.

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MATERIALS

Concrete for all floors and walls.

California Redwood for all exposed wood including furniture.

Celotex for the ceiling panels between rafters of living room.

Composition roofing.

Glass.



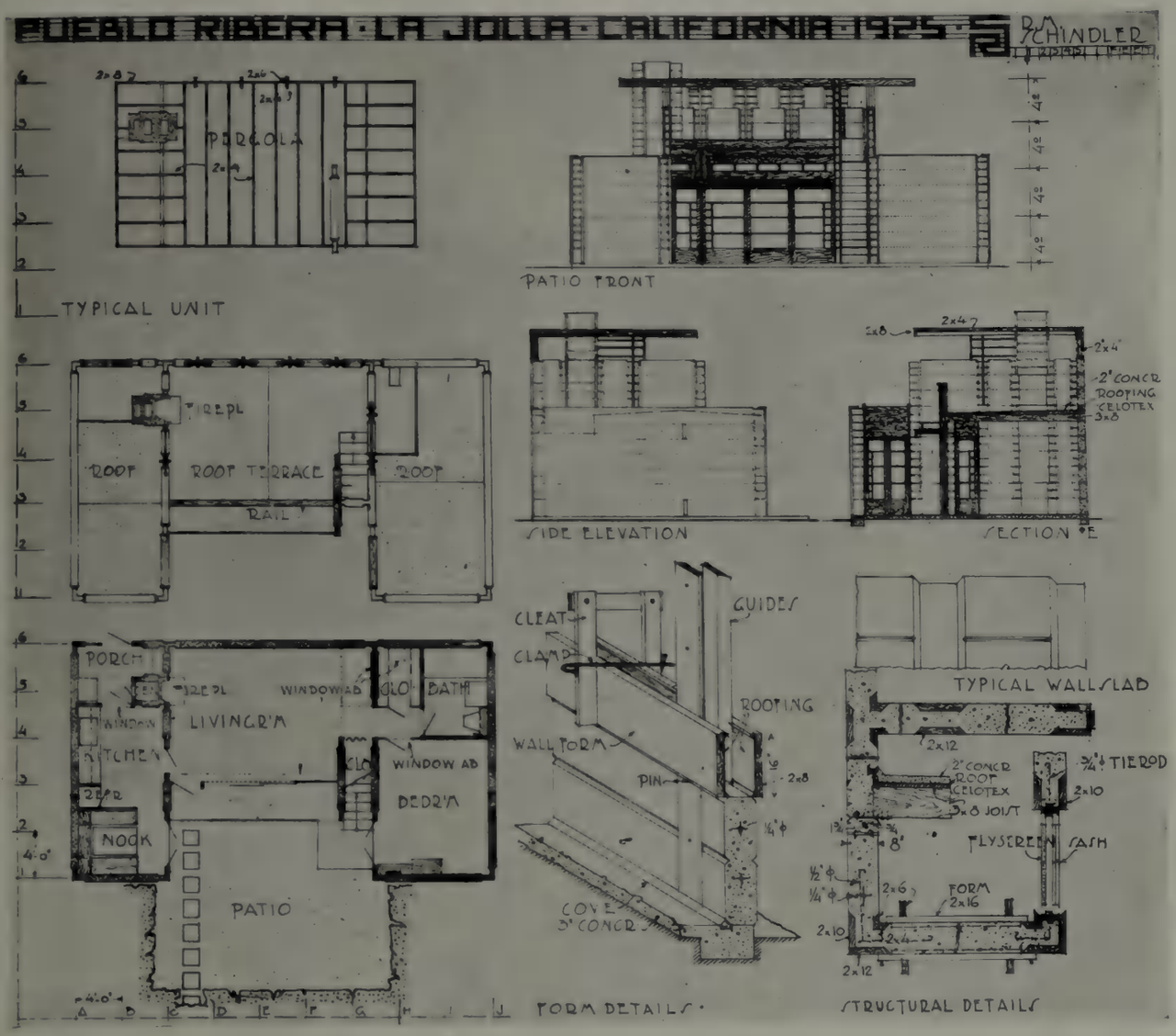
VIEW OF FRONT ELEVATION



A TYPICAL UNIT

PUEBLO RIBERA, LA JOLLA, CALIFORNIA

R. M. SCHINDLER, ARCHITECT



CONSTRUCTION DETAILS
PUEBLO RIBERA, LA JOLLA, CALIFORNIA
R. M. SCHINDLER, ARCHITECT

TEXTURES

Cast concrete, medium rough. Surfaced wood. Glass.

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COLOR

Concrete Stain (acid): tan to terra cotta.

Waxed Natural California Redwood: brown red.

Natural Celotex: tan.

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LANDSCAPING

The planting scheme carries the layout of the house into the open. Lawn courts surrounded by salt bush hedges. Torrey pines at entrances. Climbing vines for walls and pergolas.

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INTERIOR VIEWS OF THE WOMEN'S CLUB OF CHICAGO

HOLABIRD AND ROOT, ARCHITECTS

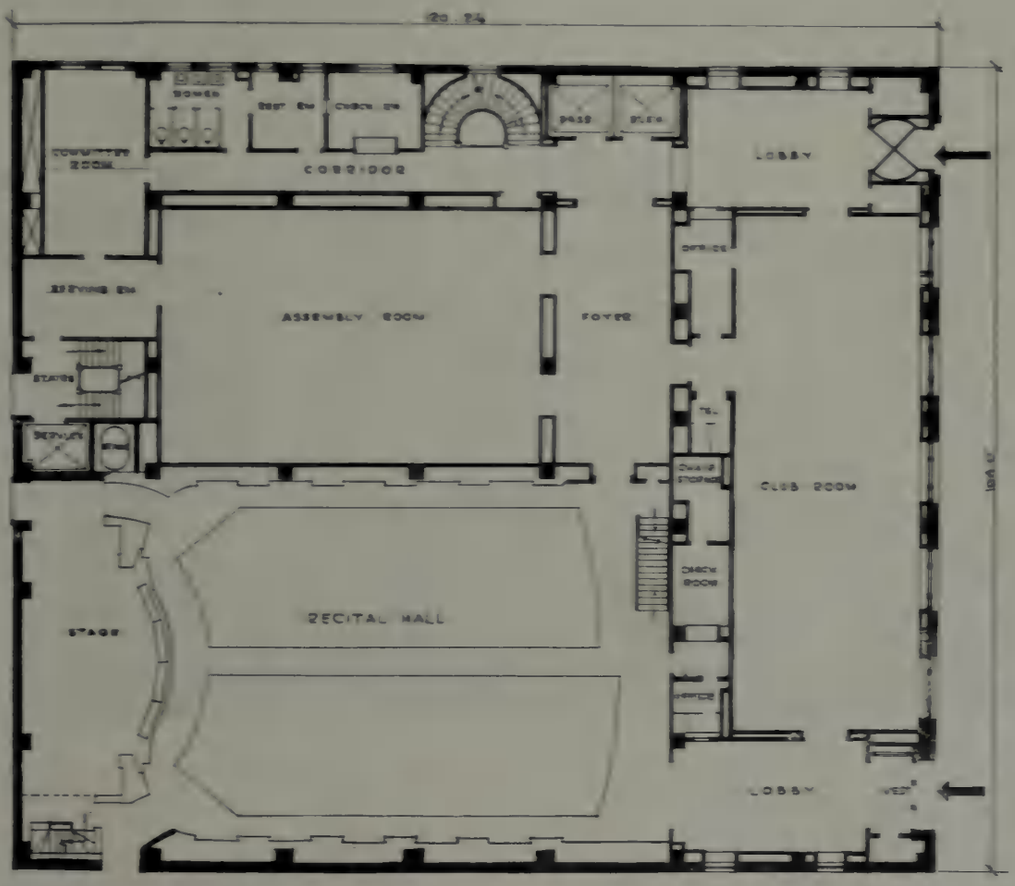


WOMEN'S CLUB OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

Club Lounge, with Gold Damask Hangings and Block-Patterned Carpet in Wood Tones



TYPICAL FLOOR PLAN



FIRST FLOOR PLAN
CHICAGO WOMEN'S CLUB

HOLABIRD & ROOT
ARCHITECTS



WOMEN'S CLUB OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

Stairway Between Second and Third Floors, Finished in Silver



Corner of Breakfast or Small Private Dining Room, with Sun Yellow Walls and Pistachio Green Taffeta Draperies

WOMEN'S CLUB OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS



WOMEN'S CLUB OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

Directors' Room, with Violet Satin Draperies and Carpeting, and Accents of Green in Wall Paper and Chair Upholstery



Corridor Adjoining First Floor Lobby

WOMEN'S CLUB OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS



WOMEN'S CLUB OF CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

PORTFOLIO OF CURRENT ARCHITECTURE



FULTON STREET SCHOOL, HEMPSTEAD, N. Y.
ERNEST SIBLEY, ARCHITECT

FEATURING SCHOOL BUILDINGS



Photo. R. S. Grant

FULTON STREET SCHOOL, HEMPSTEAD, N. Y.

ERNEST SIBLEY, ARCHITECT

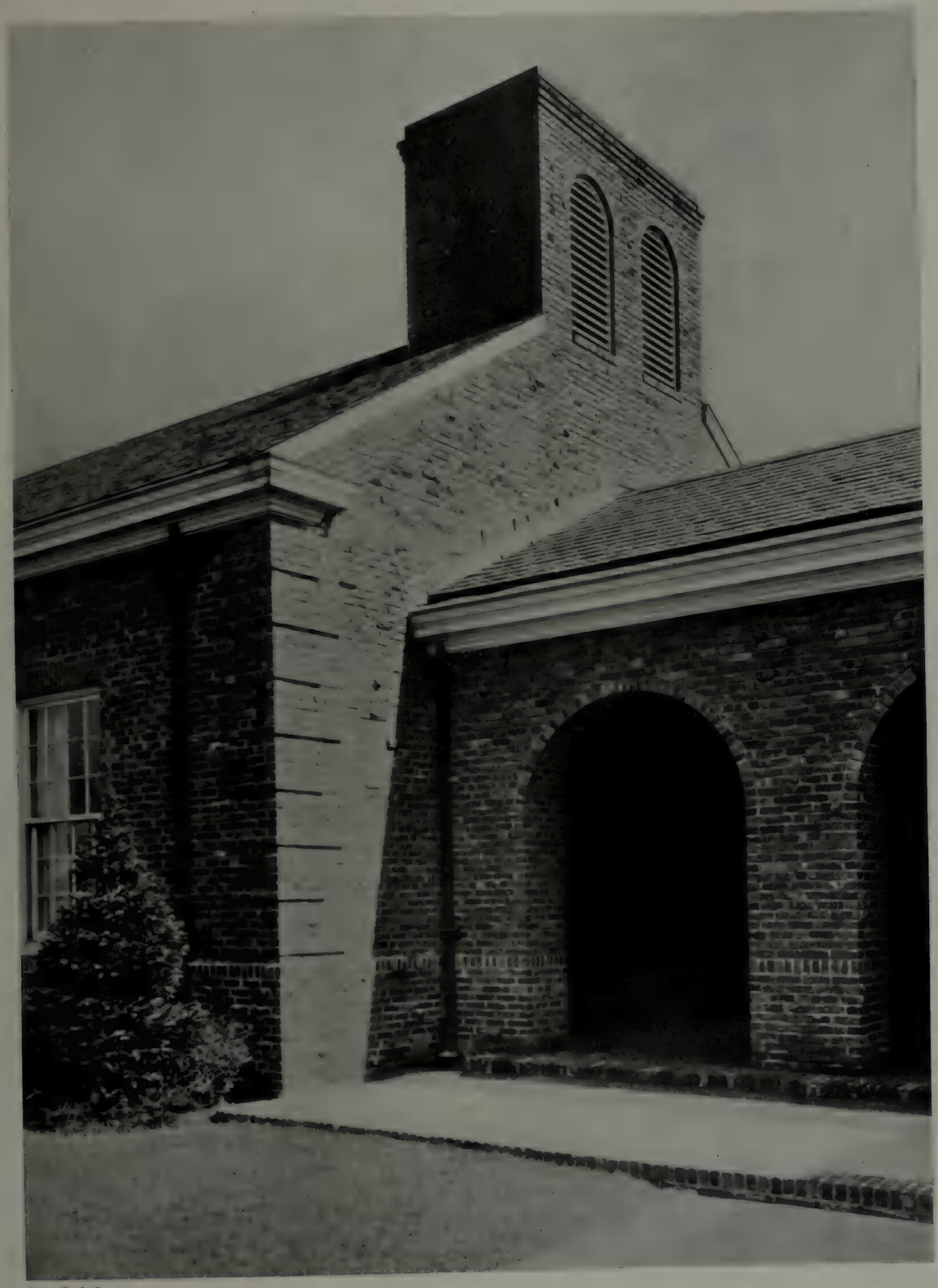


Photo. R. S. Grant

FULTON STREET SCHOOL, HEMPSTEAD, N. Y.

ERNEST SIBLEY, ARCHITECT



Photo. R. S. Grant

FRANKLIN STREET SCHOOL, HEMPSTEAD, N. Y.

ERNEST SIBLEY, ARCHITECT

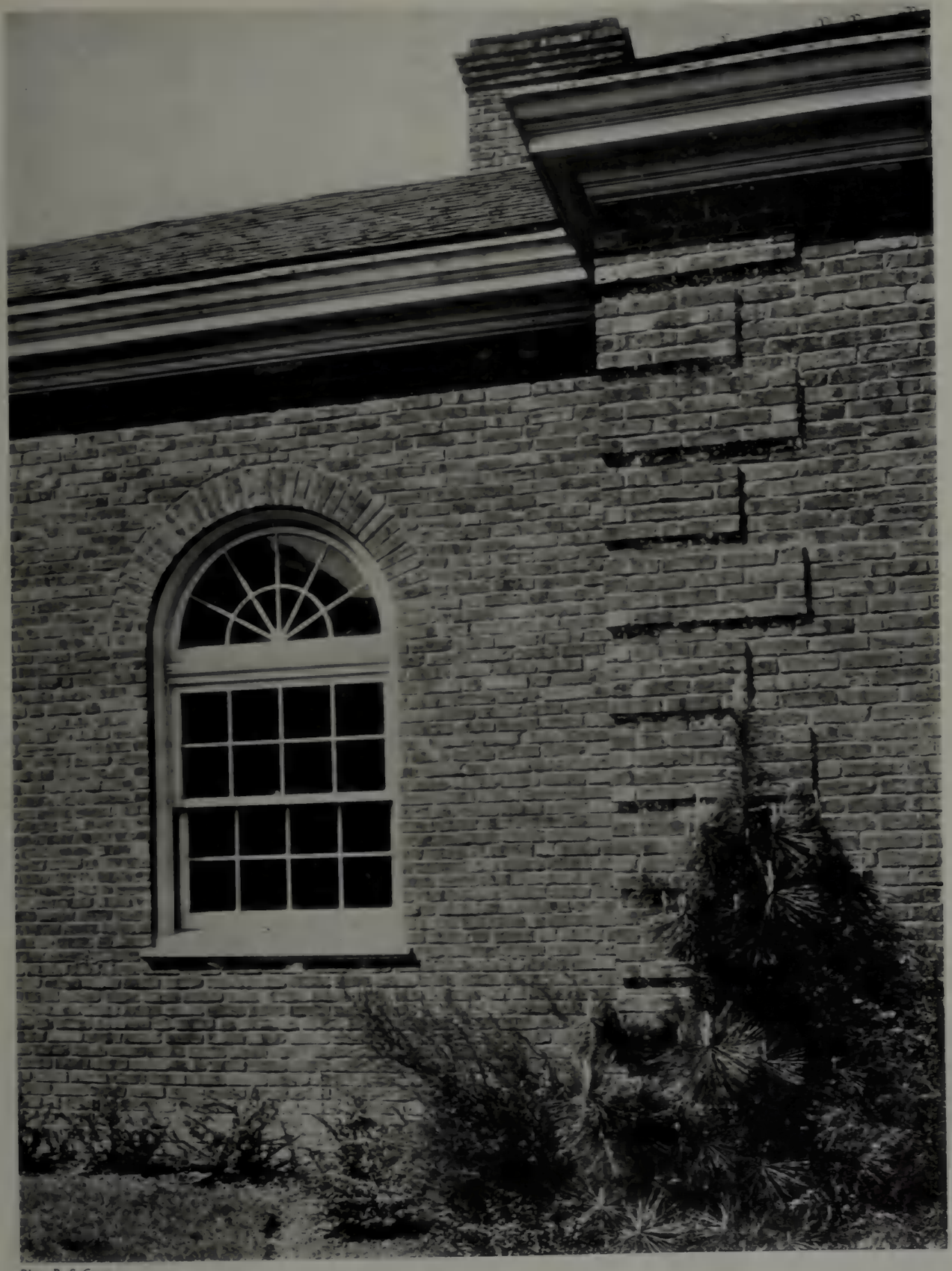


Photo. R. S. Grant

FRANKLIN STREET SCHOOL, HEMPSTEAD, N. Y.

ERNEST SIBLEY, ARCHITECT



GENERAL VIEW



Photos. R. S. Grant

ENTRANCE DETAIL

FRANKLIN STREET SCHOOL, HEMPSTEAD, N. Y.

ERNEST SIBLEY, ARCHITECT



DESIGN OF A SMALL RURAL SCHOOL HOUSE

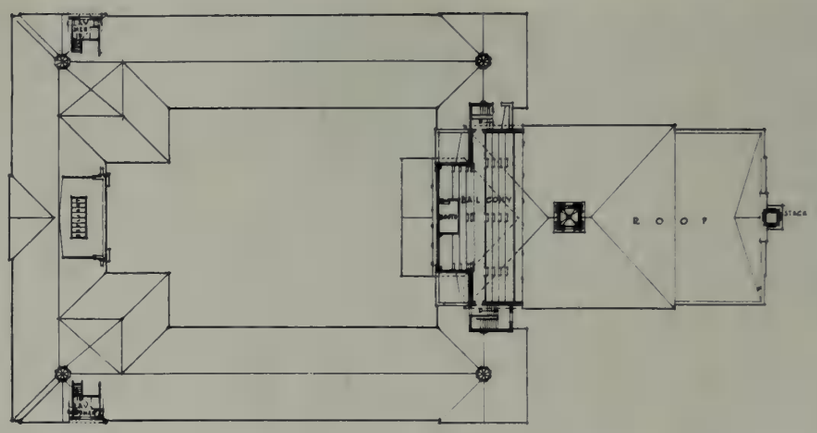
RALPH HARRINGTON DOANE, ARCHITECT



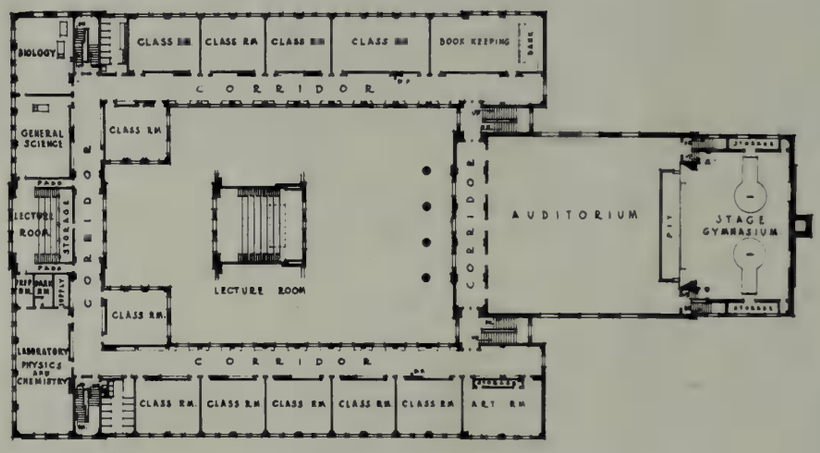
Photo. Wallace

MEMORIAL HIGH SCHOOL, HADDONFIELD, N. J.

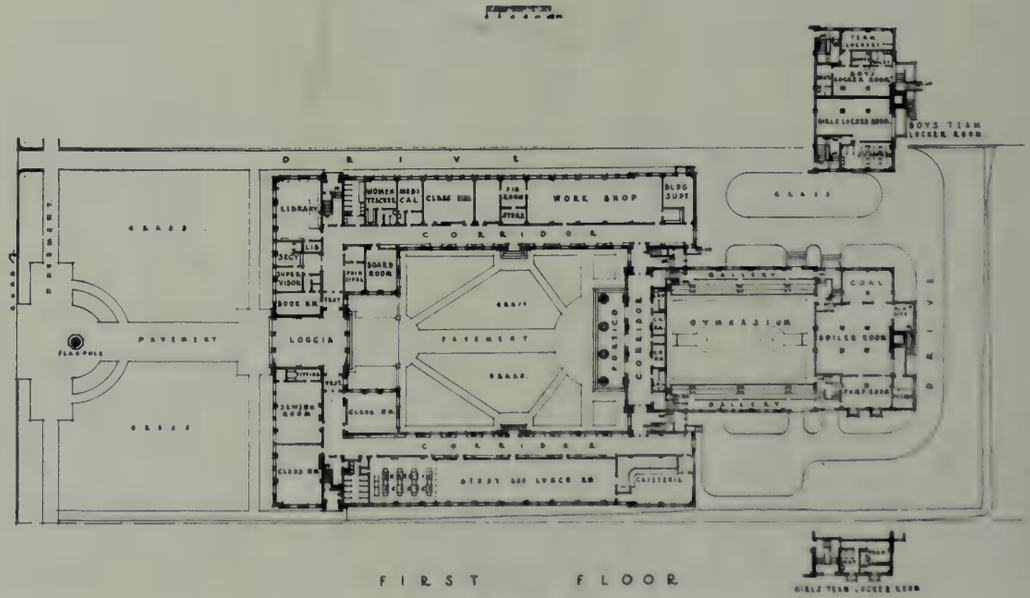
SIMON AND SIMON, ARCHITECTS



BALCONY AND ROOF PLAN



SECOND FLOOR



FIRST FLOOR

MEMORIAL HIGH SCHOOL, HADDONFIELD, N. J.

SIMON AND SIMON, ARCHITECTS



CORRIDOR LIGHTED FROM COURTYARD



Photos. Wallace

MEMORIAL HIGH SCHOOL, HADDONFIELD, N. J.

SIMON AND SIMON, ARCHITECTS

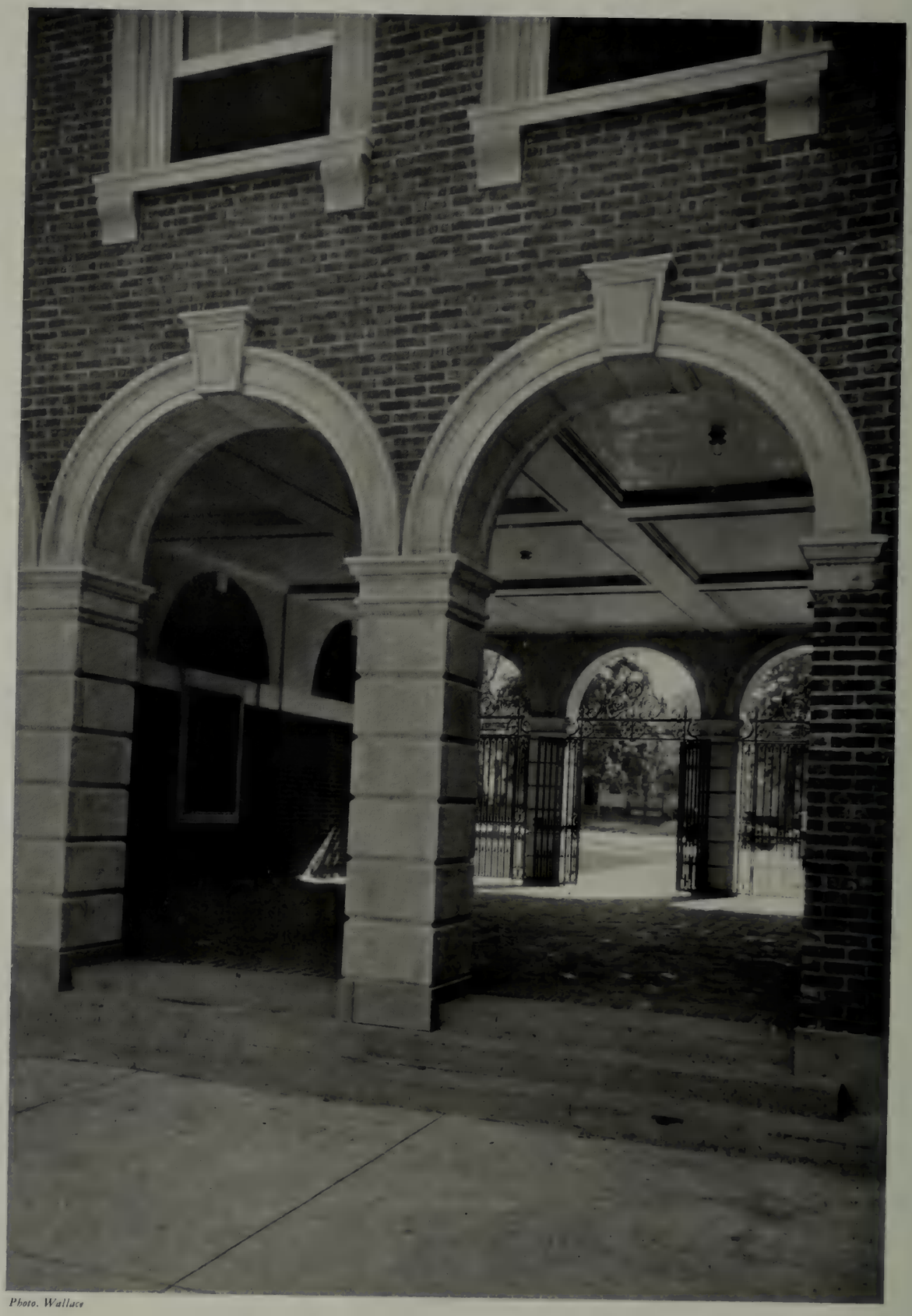


Photo. Wallace

VIEW OF ENTRANCE GATEWAY FROM COURTYARD

MEMORIAL HIGH SCHOOL, HADDONFIELD, N. J.

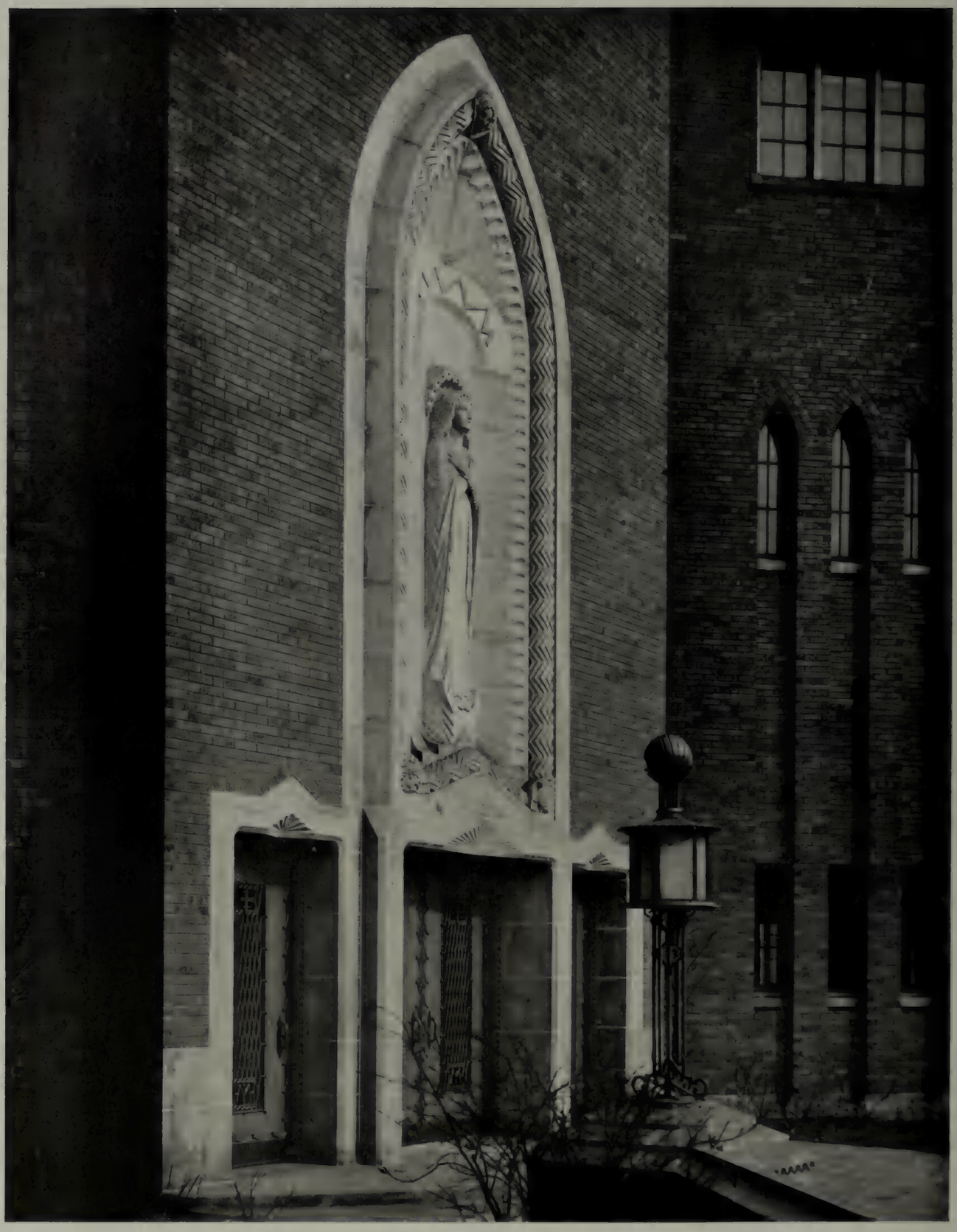
SIMON AND SIMON, ARCHITECTS



ENTRANCE DOOR WITH ORNAMENTAL WORK IN CAST STONE

SCHOOL OF ST. FRANCIS XAVIER, WILMETTE, ILL.

ALFONSO IANNELLI, SCULPTOR



IMMACULATA HIGH SCHOOL, CHICAGO

BARRY BYRNE, ARCHITECT

ALFONSO IANNELLI, COLLABORATING SCULPTOR



ST. MARY'S HIGH SCHOOL, CHICAGO

BARRY BYRNE, ARCHITECT

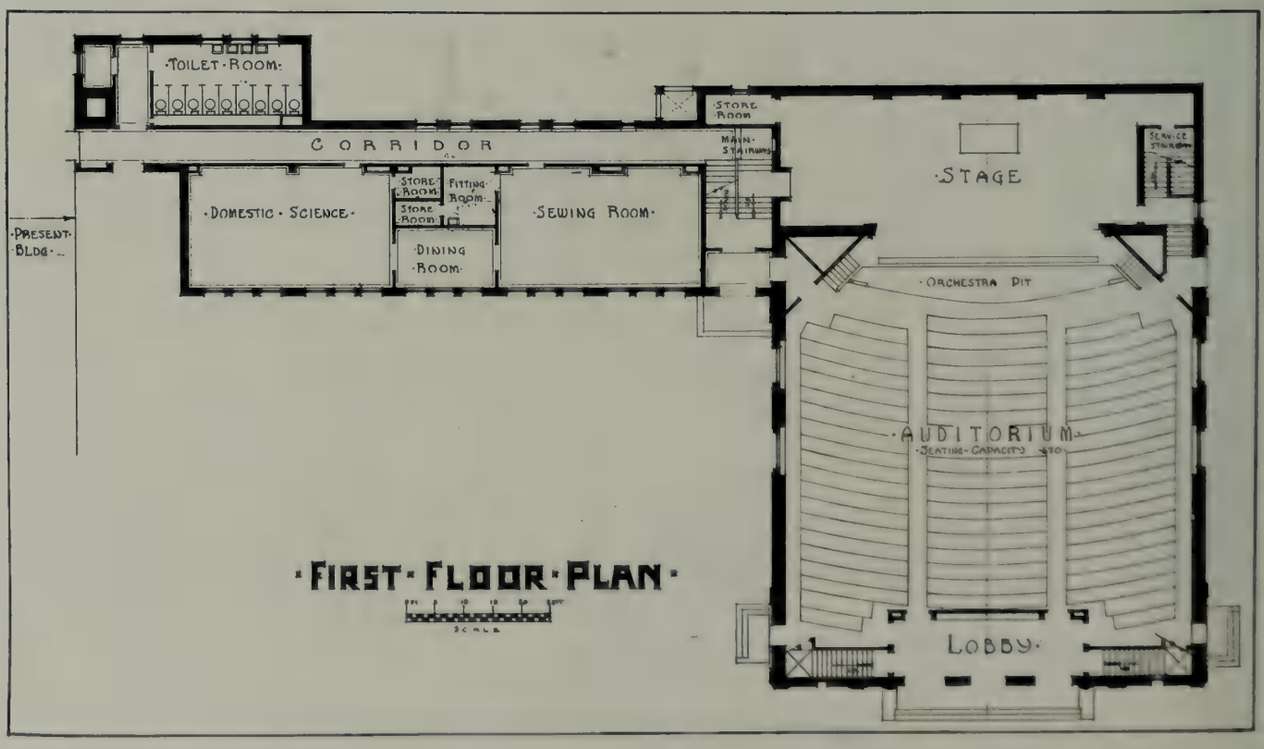
ALFONSO IANNELLI, COLLABORATING SCULPTOR



AUDITORIUM

ST. MARY'S HIGH SCHOOL, CHICAGO

BARRY BYRNE, ARCHITECT





ENTRANCE



HENRY B. PLANT HIGH SCHOOL, TAMPA, FLORIDA

FRANKLIN O. ADAMS, ARCHITECT

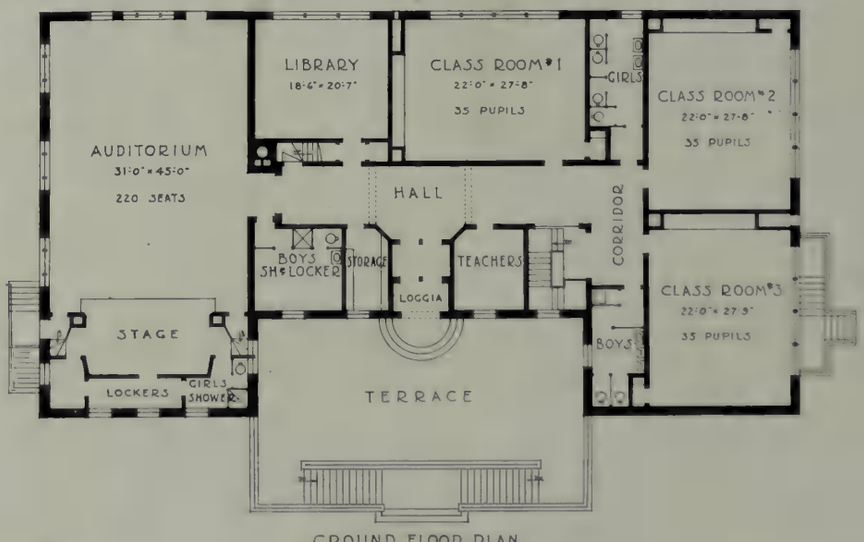
JEFFERSON M. HAMILTON, ASSOCIATE ARCHITECT



Photo. Gottscho

UNION FREE SCHOOL, COLD SPRING HARBOR, N. Y.

PEABODY, WILSON AND BROWN, ARCHITECTS



GROUND FLOOR PLAN



Photo. Rembrandt Studio

LONGUE VUE COUNTRY CLUB, PITTSBURGH, PA.

JANSSEN AND COCKEN, ARCHITECTS

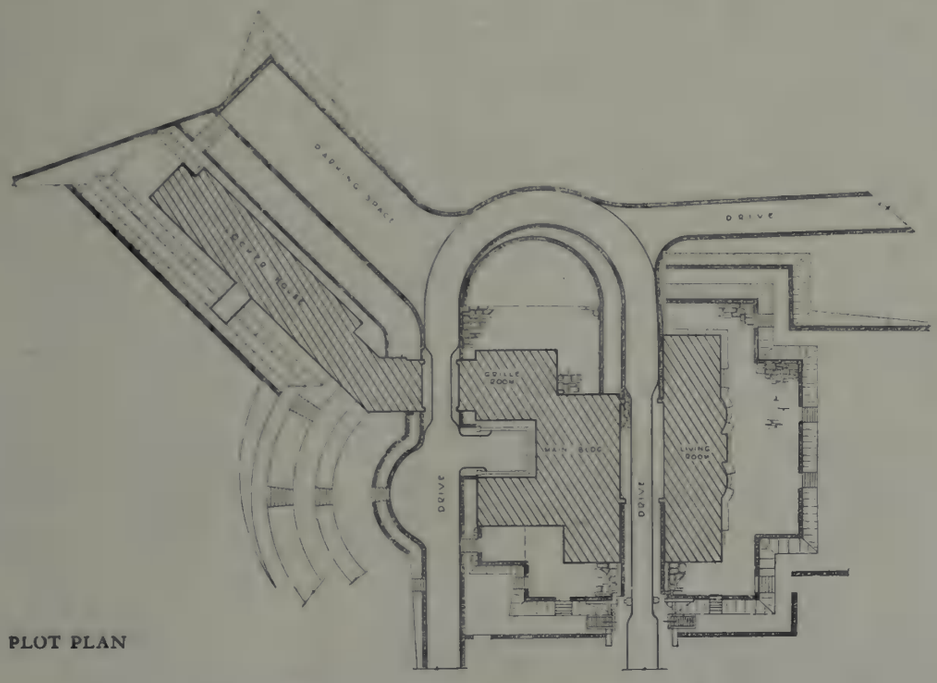


LONGUE VUE COUNTRY CLUB, PITTSBURGH, PA.

JANSSEN AND COCKEN, ARCHITECTS



HOUSE FOR MR. EDGAR J. KAUFMANN, PITTSBURGH, PA.
JANSSEN AND COCKEN, ARCHITECTS



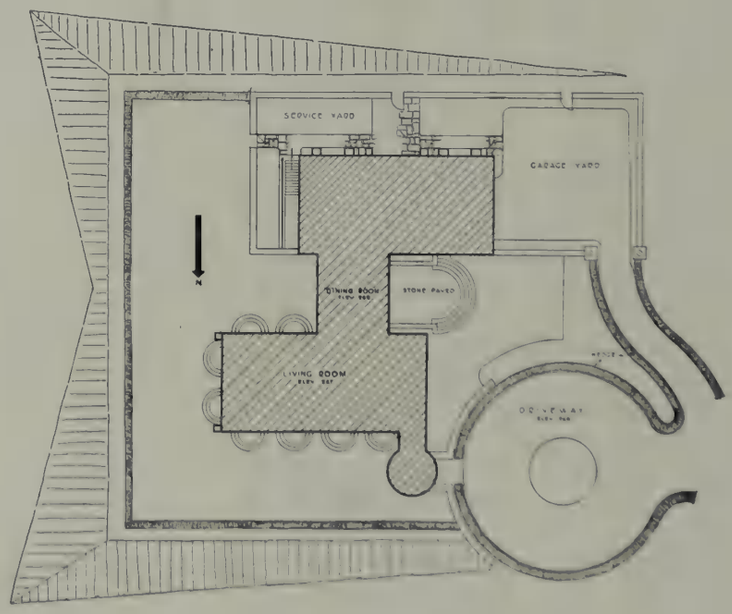
PLOT PLAN

LONGUE VUE COUNTRY CLUB, PITTSBURGH, PA.
JANSSEN AND COCKEN, ARCHITECTS



HOUSE FOR MR. EDGAR J. KAUFMANN, PITTSBURGH, PA.

JANSSEN AND COCKEN, ARCHITECTS



SOME NEW WORK IN CALIFORNIA

BY KEM WEBER



Photo. Will Connell

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER

Market Street facade. Gray-green glazed terra cotta with Monel metal muntins and signs. Deep muntins however prevent good access of daylight. Imported Italian marble between windows. A steel hung opening for the main entrance is made to suggest masonry arch construction. Lettering above entrance is not easily read, whereas lettering at top of facade is not readily seen



Photo. Will Connell

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER

Entrance Lobby. Elevator doors of chased silver with small glass openings. Lighting fixture of sand-blasted glass and chromium-plated metal. Bas-reliefs by Eugene Maier Krieg



Photo. Will Connell

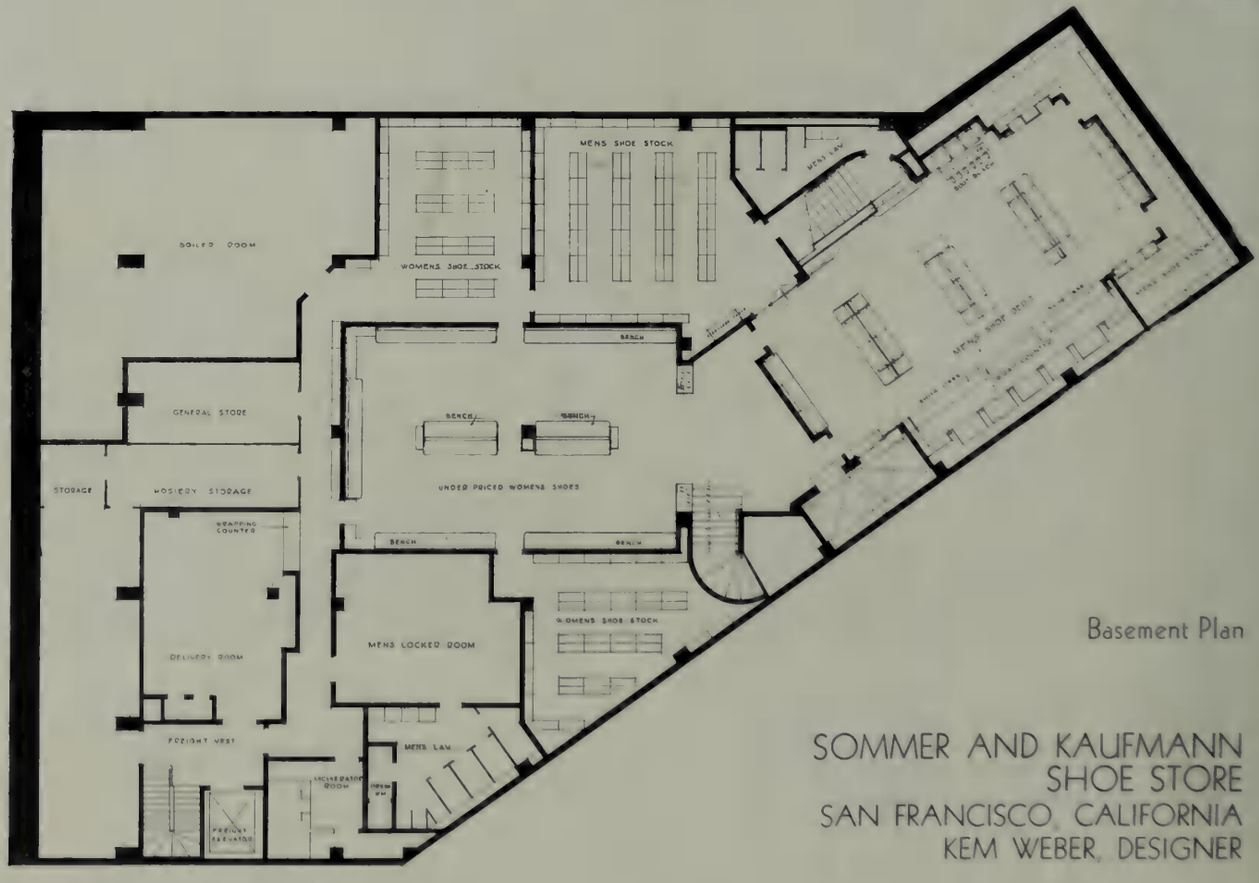
Vestibule with thirteen small display cases. Windows have bases of verdi antique marble and cornices of Monel metal. In ceiling soffit ribs of Monel metal and panels of sand-blasted glass.

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER



Photo. Will Connell

Hosiery alcove in the main sales room. Furniture of American black walnut. Columns of Napoleon melange marble. Walls of varying shades of yellow stucco



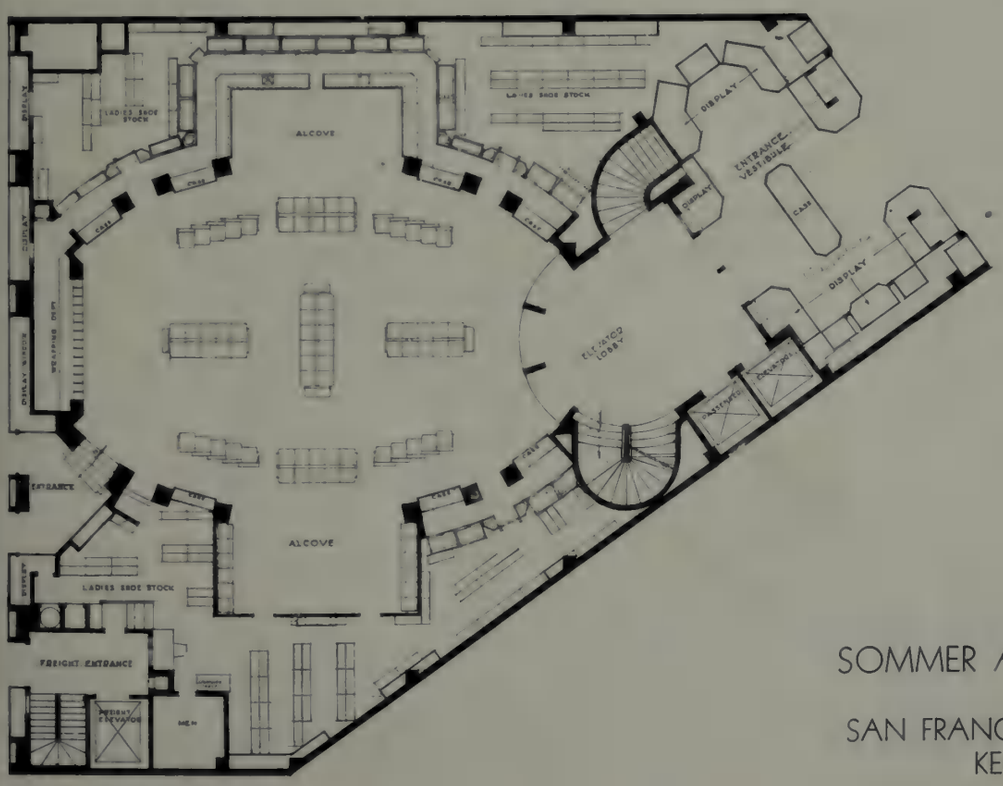
Basement Plan

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER



Photo. Will Connell

The wrapping counter is behind this marble wall at the end of the main sales room. The vertical louvres of ½-inch plate glass are so arranged that from any point in the room the salesman can see when his customer's package is ready. A good arrangement. Lamson tubes connect with the cashier and credit department



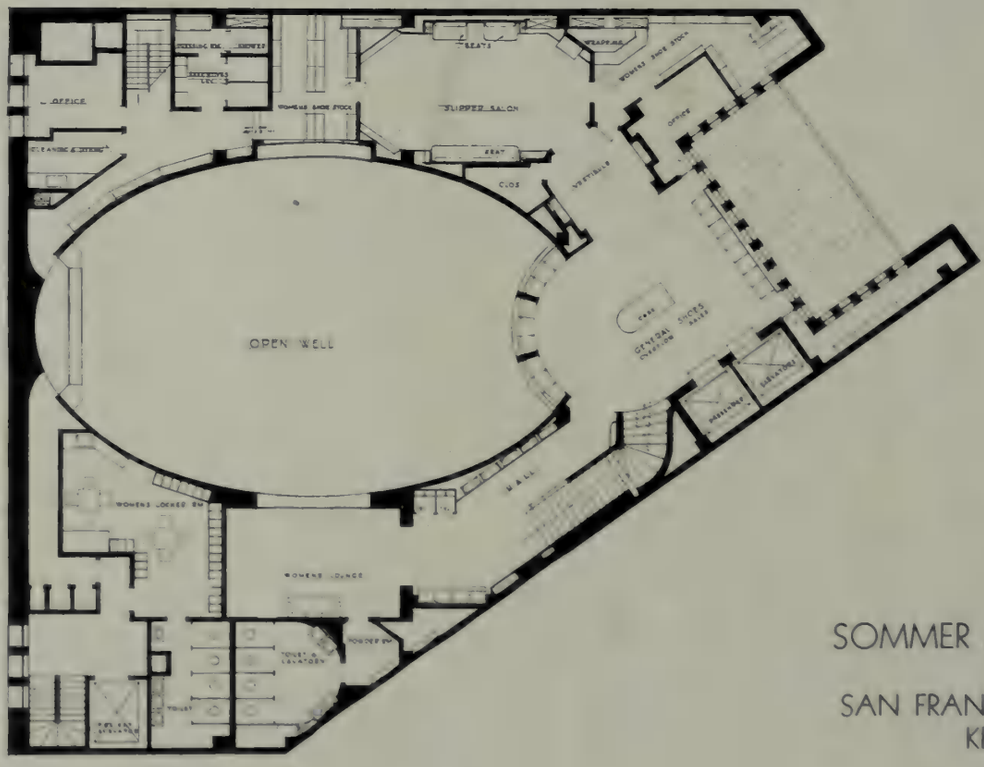
First Floor Plan

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER



Photo. Will Connell

Detail of integral lighting for stairs on mezzanine floor

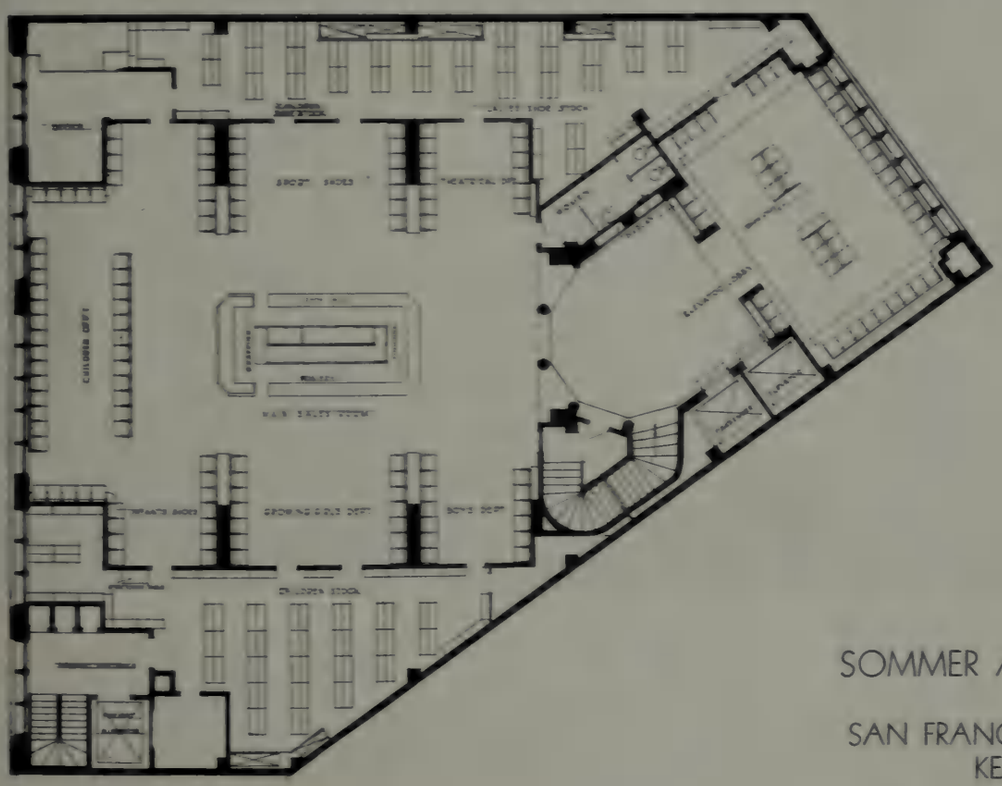


Mezzanine Floor Plan

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER



Slipper room on the mezzanine floor where formal evening footwear is sold. Color scheme in green. Furniture of Macassar ebony upholstered in metallic fabric. Good straightforward lighting arrangement



Third Floor Plan

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER



Photo. Will Connell

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER

Detail of brass lighting fixture in main sales room, 13' x 35' and in two levels with center recessed. Designed to accommodate Holophane lens plates 12-inches square laid in groups of four



Photo. Will Connell

Private office of executive. Walls of cork tile and plaster. Desk of teak wood. Chairs in blue leather

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER



Photo. Will Connell

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER

Children's department showing linoleum floor treatment



Photo. Will Connell

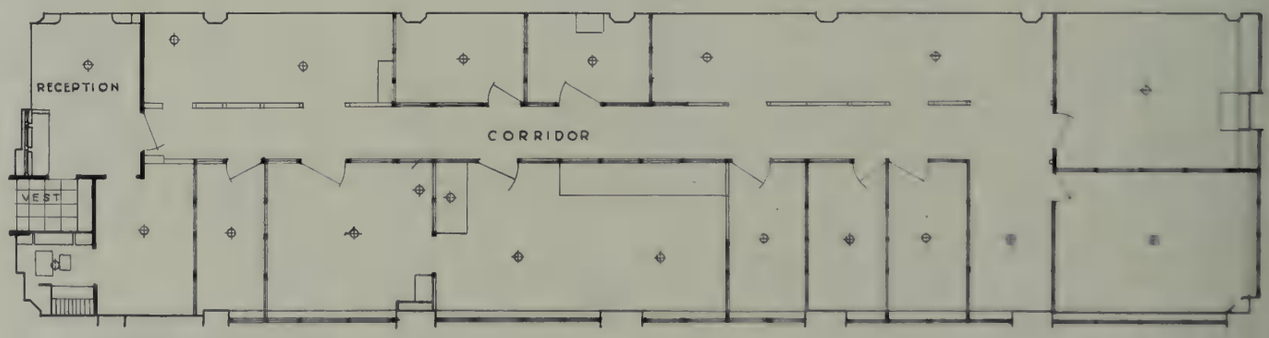
Main sales room with elevator lobby in rear. Gray Italian marble up to mezzanine floor level. Yellow dominating color in carpet

SOMMER AND KAUFMANN
SHOE STORE
SAN FRANCISCO, CALIFORNIA
KEM WEBER, DESIGNER

WORKING DRAWINGS AND PHOTOGRAPHS OF DETAILS

ADVERTISING OFFICES OF THE MAYERS COMPANY

LOS ANGELES, CALIFORNIA



PLAN OF OFFICE LAYOUT

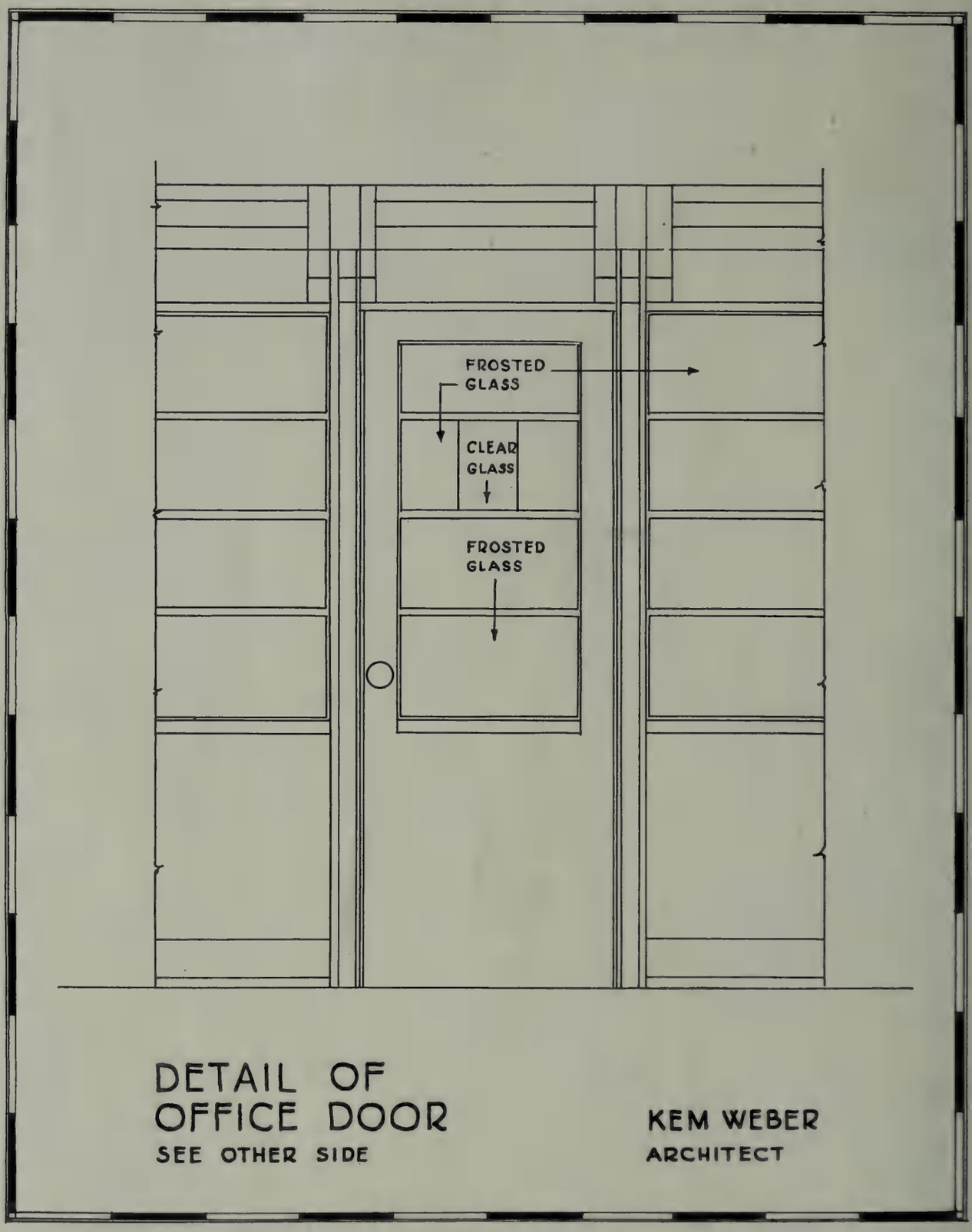
Remodeling Designed By Kem Weber



Photo. Willard D. Morgan

Each private office has a small unfrosted square of glass permitting one to look in without disturbing any special meeting or conference by opening the door

ADVERTISING OFFICES OF THE
MAYERS COMPANY, LOS ANGELES
KEM WEBER, DESIGNER



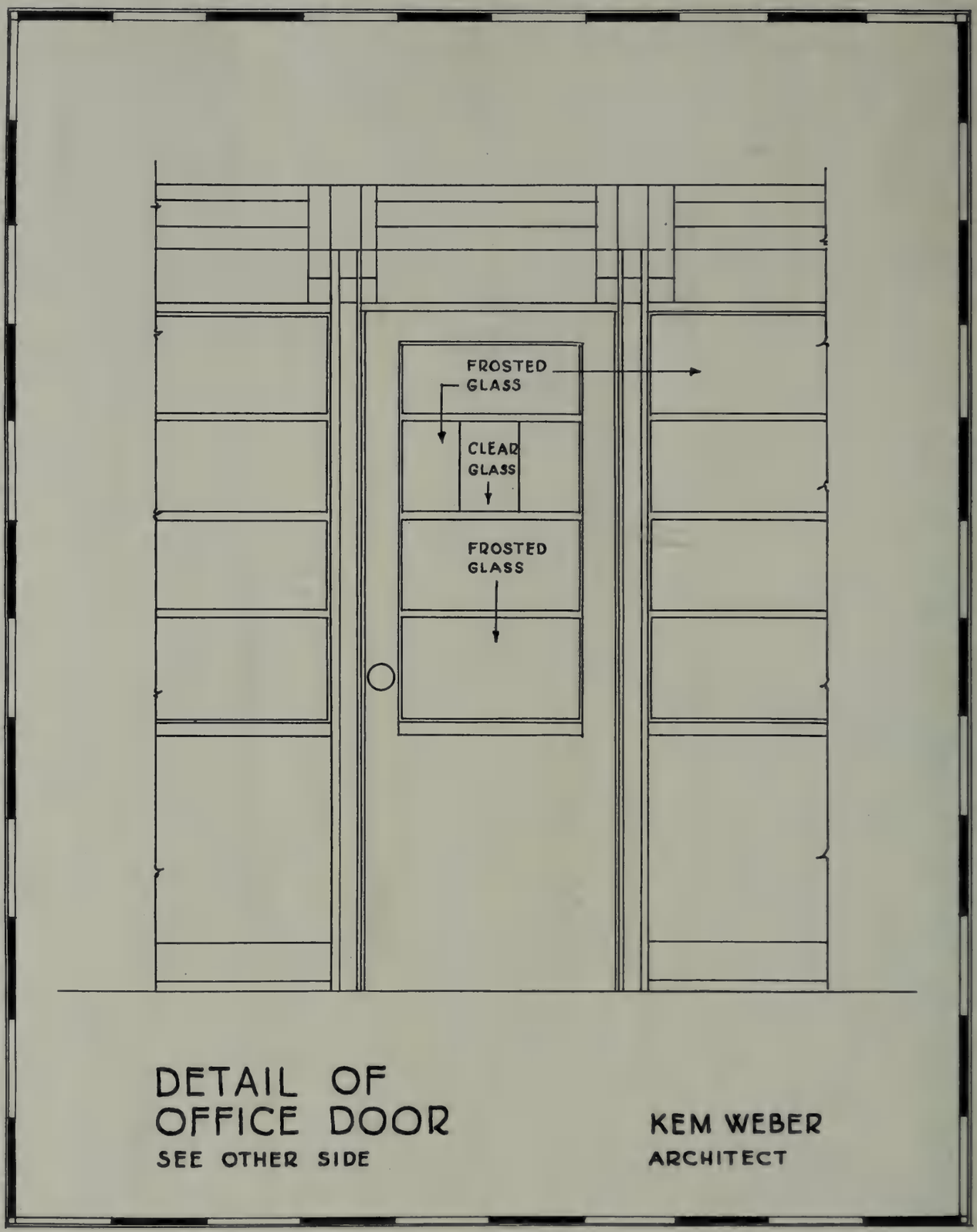
ADVERTISING OFFICES OF THE
MAYERS COMPANY, LOS ANGELES



Photo. Willard D. Morgan

This entrance has a telephone booth at the right

ADVERTISING OFFICES OF THE MAYERS COMPANY, LOS ANGELES
KEM WEBER, DESIGNER



DETAIL OF
OFFICE DOOR

SEE OTHER SIDE

KEM WEBER
ARCHITECT

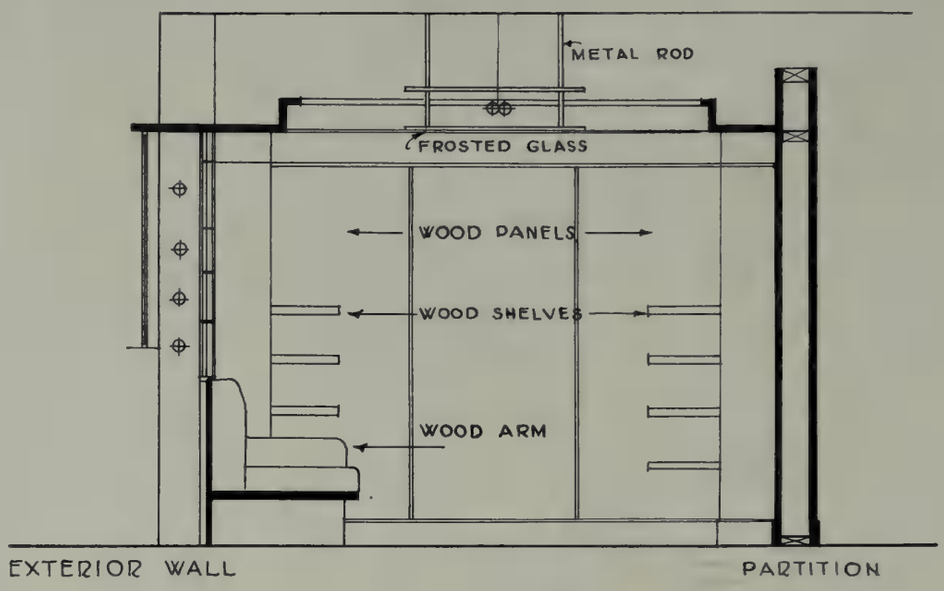
ADVERTISING OFFICES OF THE
MAYERS COMPANY, LOS ANGELES



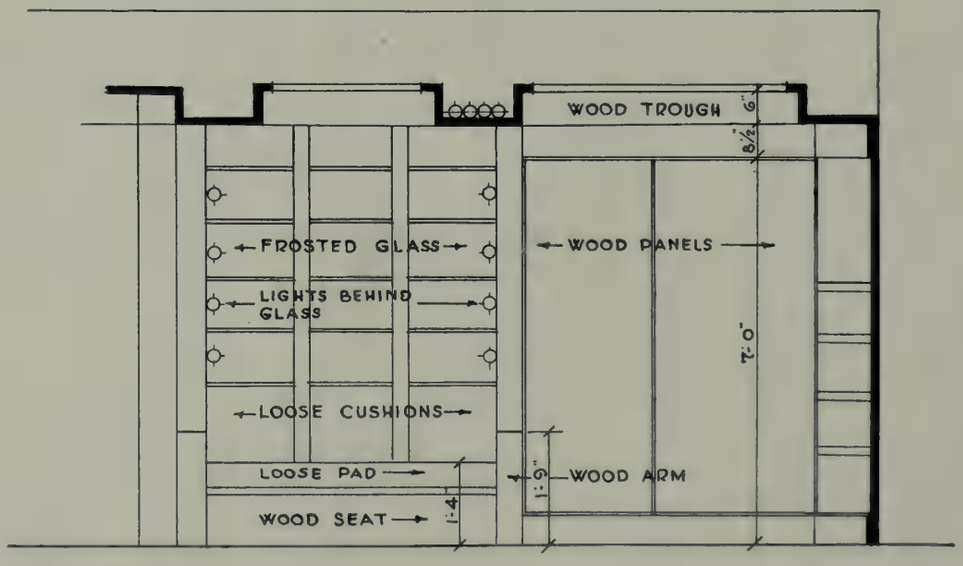
Photo. Willard D. Morgan

This entrance has a telephone booth at the right

ADVERTISING OFFICES OF THE
MAYERS COMPANY, LOS ANGELES
KEM WEBER, DESIGNER



SECTION



DETAILS OF RECEPTION ROOM

KEM WEBER ARCHITECT

ADVERTISING OFFICES OF THE MAYERS COMPANY, LOS ANGELES



THE DESIGN OF VERTICAL TUBULAR STEEL FLAGPOLES

BY S. J. WARBERG

The required strength of a flagpole at any point is governed by the more severe of two conditions:

(a) When a flag is flown from the pole, the strength required is governed by the size of the flag and the maximum velocity of the wind. This velocity may safely be assumed at 60 miles an hour, as a flag would be either pulled down before this velocity was attained or be torn to pieces.

(b) When no flag is flown from the pole, the strength required is governed by the maximum wind velocity recorded in the locality in question.

When these conditions are known, the pole may be designed for any height. The work is of a tedious cut-and-try character as the action of the wind on the pole itself accounts for a considerable portion of the governing bending moment, and indeed for high maximum wind velocities and the smaller sizes of flags may be the governing criteria above certain heights of poles.

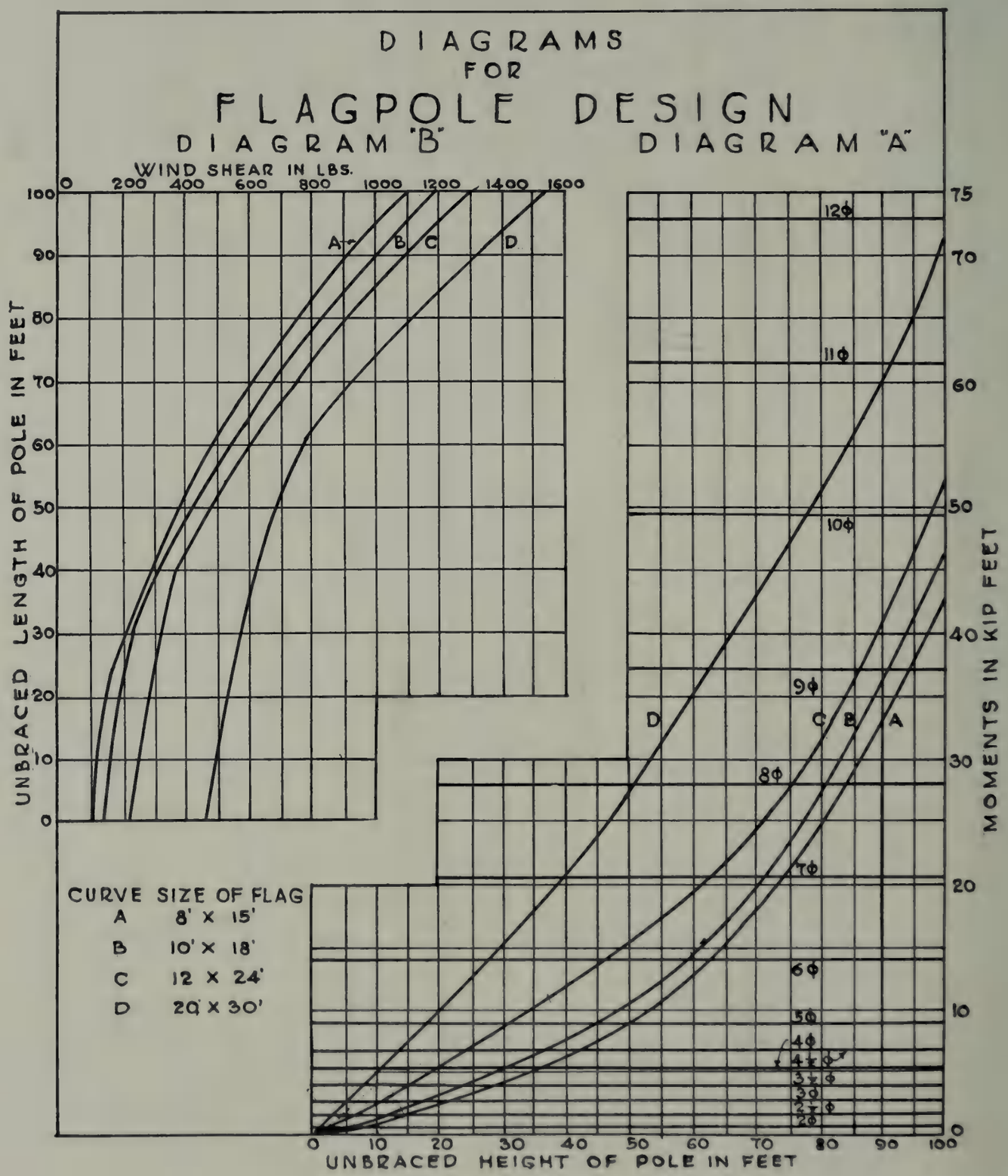
For the purpose of lightening this task, the writer has prepared curves giving bending moments and shears on four designs which are suggested as covering the most common requirements.

▪

Certain manufacturers of tubular steel flagpoles follow the practice of placing a weaker section halfway down the pole to insure a failure where the least harm will result, in case of record-breaking wind storms. This would seem good practice.

The accompanying diagrams were worked out for conditions obtaining in Detroit and vicinity and for tubular steel poles with a maximum fibre stress of 20,000 pounds per square inch, as allowed by the City of Detroit Building Department.

The maximum observed actual wind velocity for this vicinity is 86 miles an hour. In the designs suggested, a maximum velocity of 90 miles an hour has been used on poles without flags. For poles with flags a velocity of 60 miles an hour has been used.



Inquiry revealed certain customs and usages with regard to **selection of sizes of flags** and height of poles, which are given below simply as a guide in selection:

(a) For school buildings, the following flag sizes are in common use: 5′ x 8′, 6′ x 10′, 6′ x 12′, and 8′ x 12′.

(b) For public buildings, the following sizes are used: 8′ x 15′, 9′ x 18′, 10′ x 18′, and 10′ x 20′.

(c) For tall office buildings, the flag sizes vary from 10′ x 15′ to 20′ x 30′, according to height of building.

All above flag sizes are known as "fair weather flags." In stormy weather, flags used are generally one-half these sizes.

The weather bureau, however, reports that a great many of the most violent wind storms recorded have come up during the early afternoons when "fair weather flags" were flying from the poles.

•

It would therefore hardly be advisable to design for any but fair weather sizes of flags, and this has been followed in the accompanying diagrams.

•

In general the height of pole is roughly proportioned to the size of the flag selected as follows:

On buildings not over five stories in height, the height of pole should be about three times the length of the flag. On buildings over five stories in height, the height of the pole should be about twice the length of the flag.

•

In calculating moments the pull of the flag on the pole was determined by the so-called "Navy Formula":

$$P = 0.0003\ Av^{1.9}$$ where

P = pull of flag on pole, in pounds, applied at top of flagpole,
A = area of flag in square feet,
v = velocity of wind in miles per hour, actual.

The pressure of wind on the pole itself was calculated by the formula:

$$P = 0.0025\ v^2\ d\ l$$, where

P = total wind pressure on a section of pole in pounds,
d = diameter of section in feet,
l = length of section in feet,
v = velocity of wind in miles per hour.

Diagram "A" gives maximum bending moments on four designs of poles A, B, C and D.

DESIGN

A is for flags up to and including 8′ x 15′
B is for flags up to and including 10′ x 18′
C is for flags up to and including 12′ x 24′
D is for flags up to and including 20′ x 30′

On all flagpoles, a finial was taken into consideration, consisting of a 12-inch diameter ball at 2 feet above top of flag. Height of poles is in all cases to top of flag.

Horizontal lines in Diagram "A" mark the resisting moments at a fibre stress of 20,000 pounds per square inch of standard steel pipe of the diameters given.

The designs are given in Table I, following page.

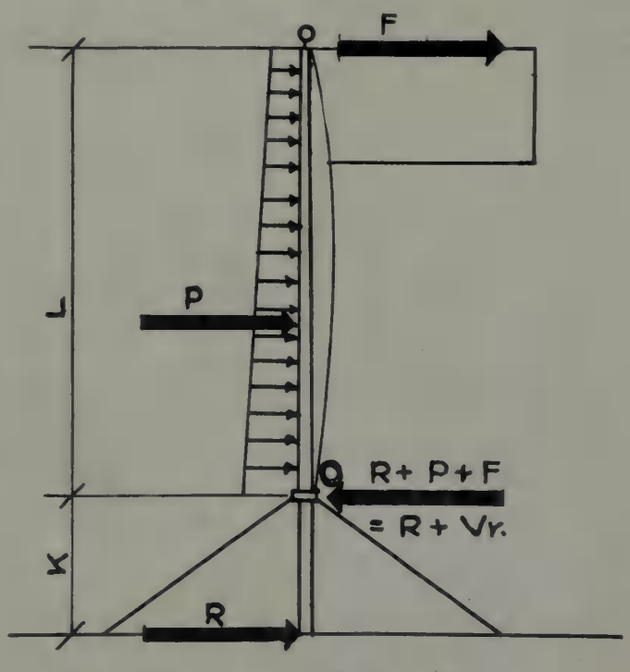


DIAGRAM "C"

TABLE I. PIPE SIZES FOR DESIGN OF FLAGPOLES

Size of Standard Pipe Inches	O. D. of Pipe Inches	Wt. per ft. of Pipe in lbs.	Length of Section in ft.			
			Pole Design "A"	Pole Design "B"	Pole Design "C"	Pole Design "D"
2"	2.375	3.652	6.5	6.0		
2½"	2.875	5.793	5.0	4.5		
3"	3.50	7.575	11.5	5.5	11.0	6.0
3½"	4.00	9.109	6.0	5.5	5.0	2.5
4"	4.50	10.790	6.0	5.5	5.0	3.0
4½"	5.00	12.538	6.5	6.0	5.0	
5"	5.625	14.617	7.0	7.0	6.0	7.5
6"	6.625	18.974	13.5	13.5	14.0	9.5
7"	7.625	23.544	10.0	14.0	14.0	10.0
8"	8.625	28.554	10.5	13.5	14.0	11.5
9"	9.625	33.907	11.0	9.0	10.0	12.5
10"	10.75	40.483	12.0	12.0	12.0	15.0
11"	11.75	45.557			9.0	12.0
12"	12.75	49.562				11.0
Total Height of Poles in feet.....			105.5	102.0	105.0	100.5

In practice it has been found that simply specifying "standard pipe" is not sufficient, as the contractor will almost invariably supply "standard gas pipe," which is much lighter and consequently weaker; the only safe way is to specify also the minimum total weight of the pole.

The pipe sizes given are *nominal* or approximate *inside* diameters of the pipe, but

EXAMPLE ILLUSTRATING USE OF TABLE I

As **an example** suppose a 60-foot pole is desired for a flag 10′ x 18′, or design "B". It is merely necessary to start at the *top* of design B and use sections from the top down, enough to give a total length of at least 60 feet; that is:

2" pipe 6′-0" + 2′-0" in telescoped joint wt. = 8 x 3.652 lbs. = 29.2 lbs.
2½" pipe 4′-6" + 2′-0" in telescoped joint wt. = 6.5 x 5.793 lbs. = 37.6 lbs.
3" pipe 5′-6" + 2′-0" in telescoped joint wt. = 7.5 x 7.575 lbs. = 56.8 lbs.
3½" pipe 5′-6" + 2′-0" in telescoped joint wt. = 7.5 x 9.109 lbs. = 68.3 lbs.
4" pipe 5′-6" + 2′-0" in telescoped joint wt. = 7.5 x 10.79 lbs. = 81.0 lbs.
4½" pipe 6′-0" + 2′-0" in telescoped joint wt. = 8.0 x 12.538 lbs. = 100.2 lbs.
5" pipe 7′-0" + 2′-0" in telescoped joint wt. = 9.0 x 14.617 lbs. = 127.3 lbs.
6" pipe 13′-6" + 2′-0" in telescoped joint wt. = 15.5 x 18.974 lbs. = 294.0 lbs.
7" pipe 6′-6" wt. = 6.5 x 23.544 lbs. = 153.0 lbs.
Total length = 60′-0" Total wt. of pole = 947.4 lbs.



FLAGPOLE ON UNION TRUST BUILDING
DETROIT, MICH.

the contractor is prone to assume this as the outside diameter (thus giving a weaker pole) unless the outside diameters are given on the detail.

•

Diagram B gives the total shears on these four designs which may be used in the design of the support of the poles as follows (see Diagram C):

Given: Size of flag and height of Pole = L.

K is determined by circumstances of location.

Then:

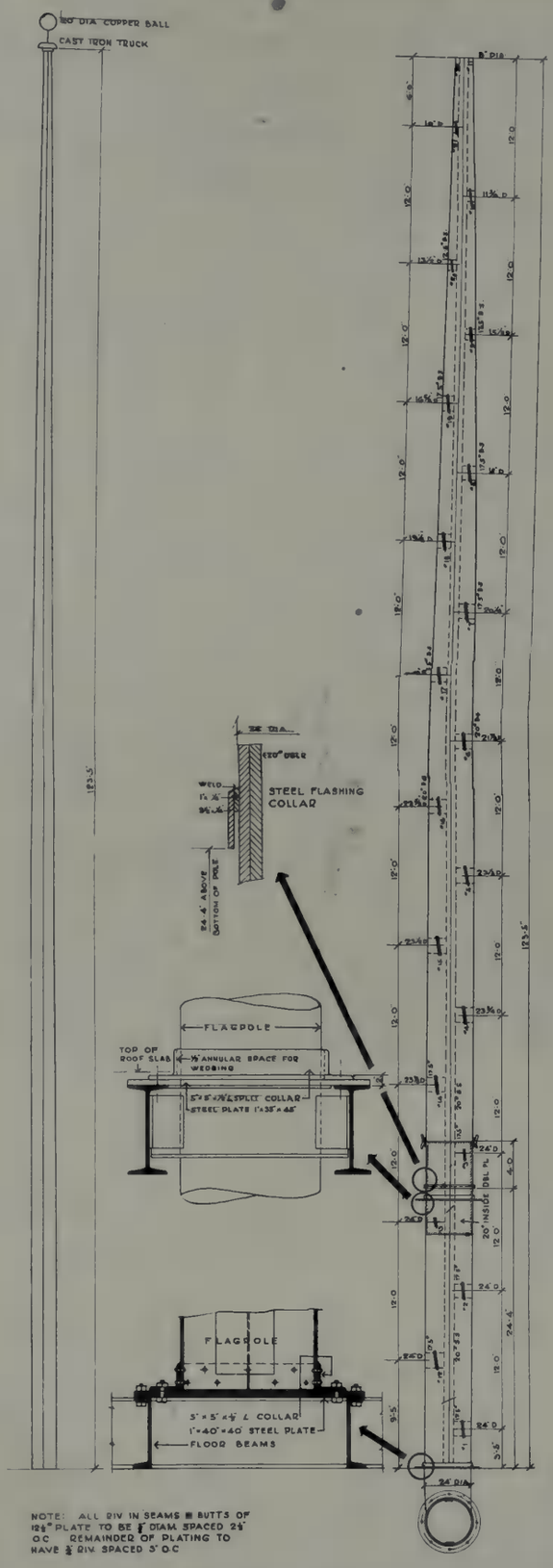
From Diagram "A", obtain Moment M_T for height L on nearest larger type of pole.

Moment at O is $M_T = K\ R$, from which

$$R = \frac{M_T}{K}$$

Maximum shear due to wind occurs just above O and may be obtained from Diagram "B" for height L and nearest larger type of pole. Let this be Vt.

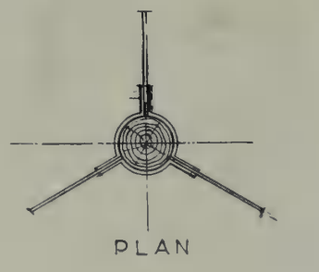
With these quantities known, the design of the bracing support for the pole is simple.

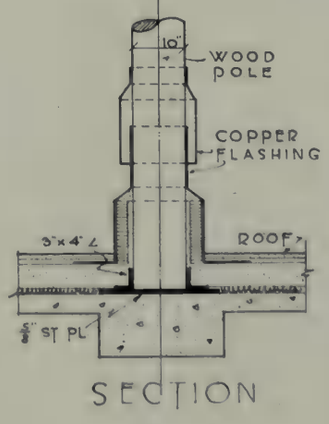


DETAIL DRAWING OF FLAGPOLE ON UNION TRUST BUILDING
DETROIT, MICHIGAN
SMITH, HINCHMAN AND GRYLLS, ARCHITECTS AND ENGINEERS

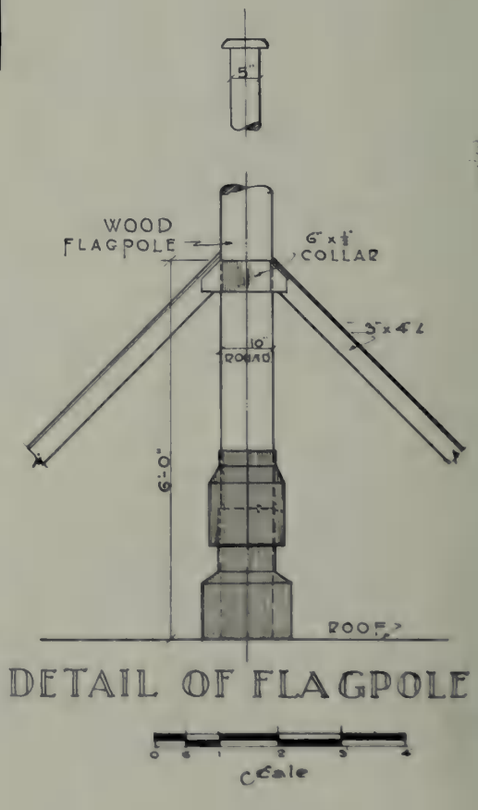


FLAGPOLE ON TOWER
NEW YORK LIFE BUILDING





SECTION



DETAIL OF FLAGPOLE

Scale

FLAGPOLE

The support and protection of a flagpole mounted on a roof top should be reduced to simplest construction. A pole up to forty feet may be of wood, preferably of clear spruce. Brace with single irons and flash base with copper

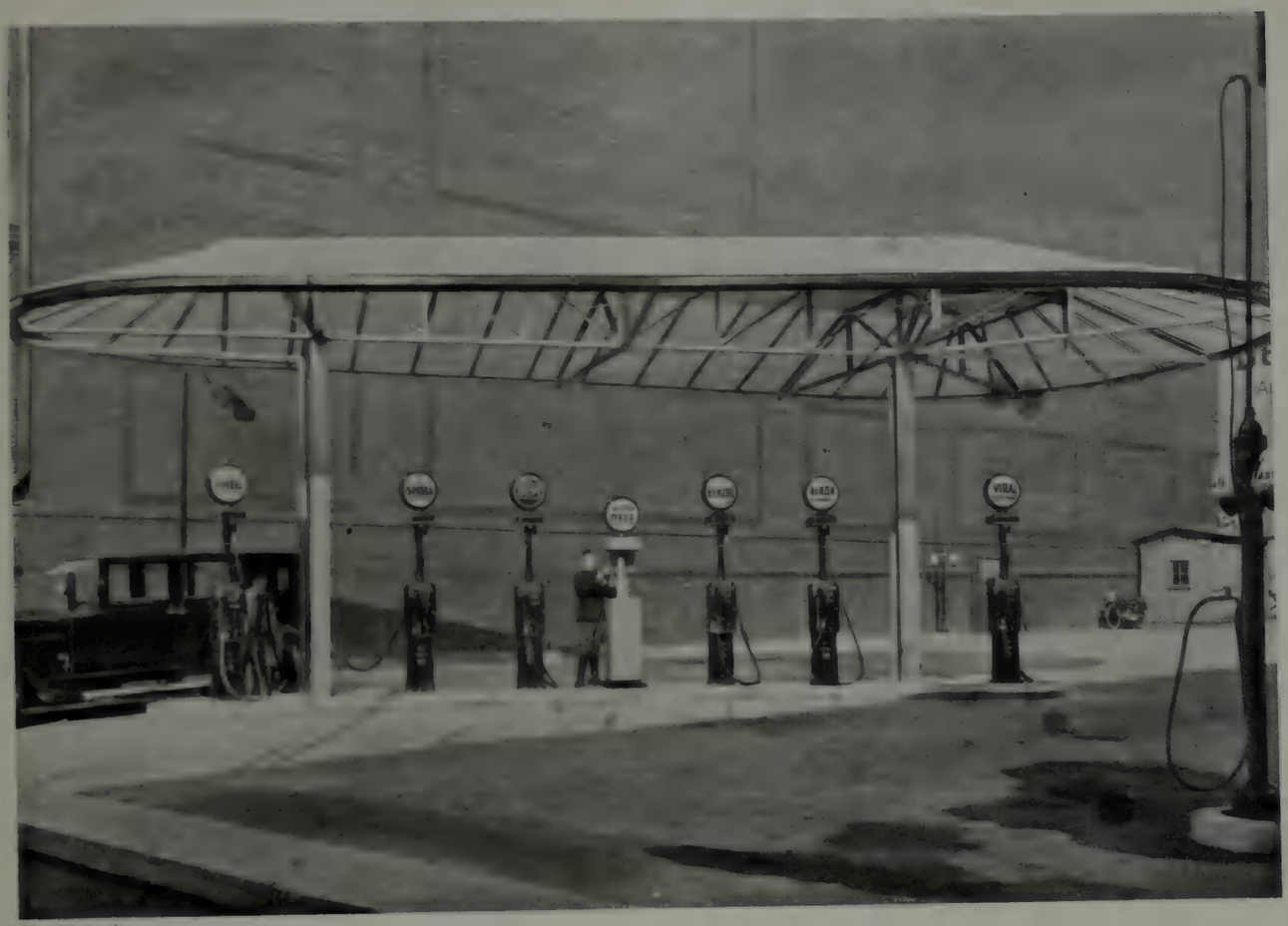
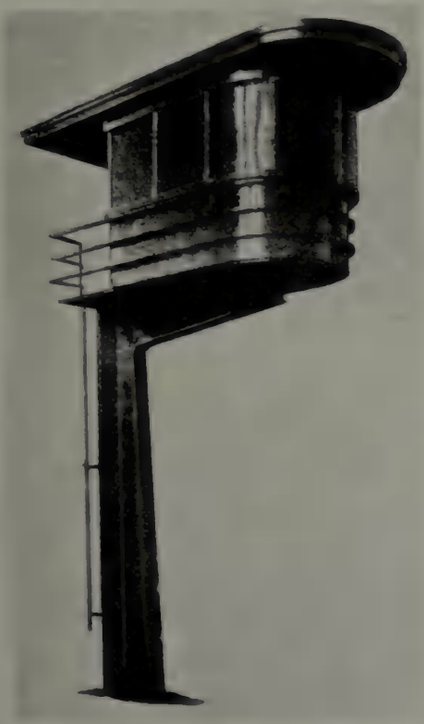
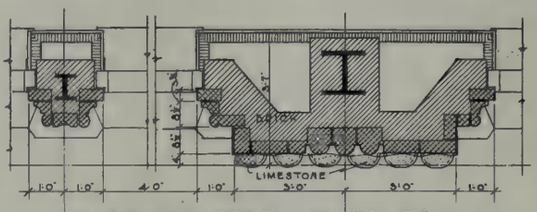


Photo Krajewsky

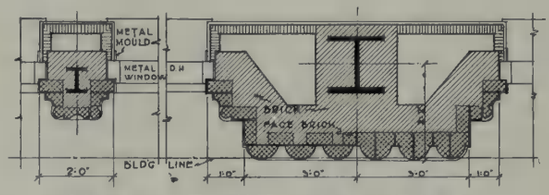
Filling Station in Berlin. Heinrich Kosina, Architect. Note the light construction of the canopy and the slender supports. See article: "The Gasoline Filling and Service Station" in the June Issue of THE ARCHITECTURAL RECORD



Traffic Tower, Berlin, Mies van der Rohe, Architect. The cantilevered support insures a minimum of obstruction to the street traffic

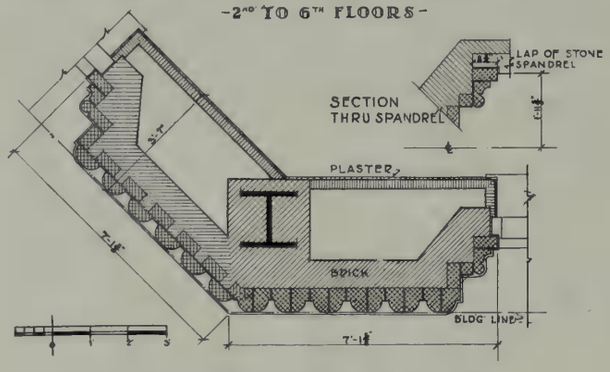


PLAN OF PIER ON 7TH FL.



PLAN OF MULLION & PIER

-2ND TO 6TH FLOORS-



PLAN OF CORNER PIER

-2ND TO 6TH FLOORS INCL.-



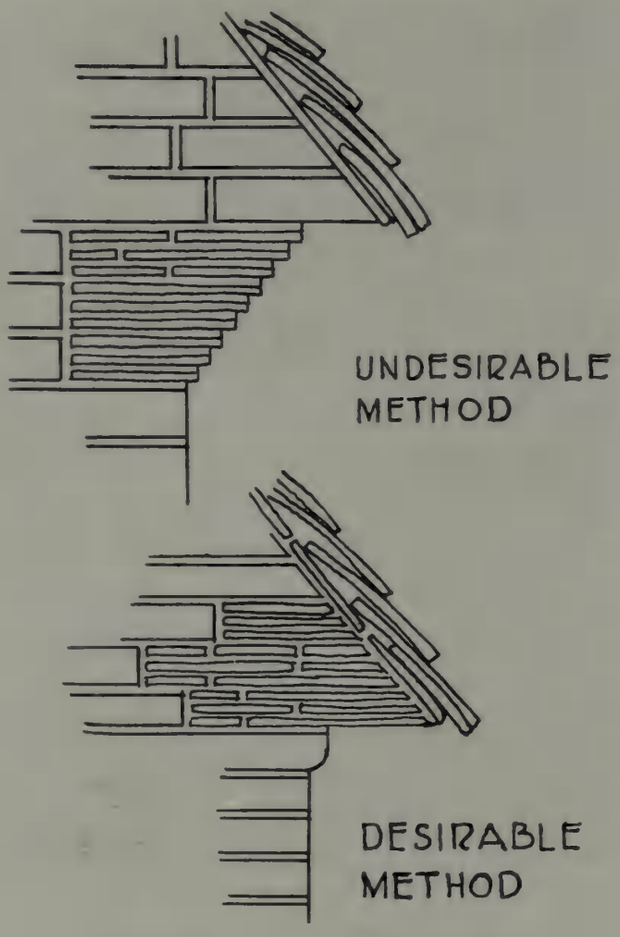
DETAILS OF BRICK PIERS AND MULLIONS
ABRAHAM AND STRAUS BUILDING, BROOKLYN
STARRETT AND VAN VLECK, ARCHITECTS

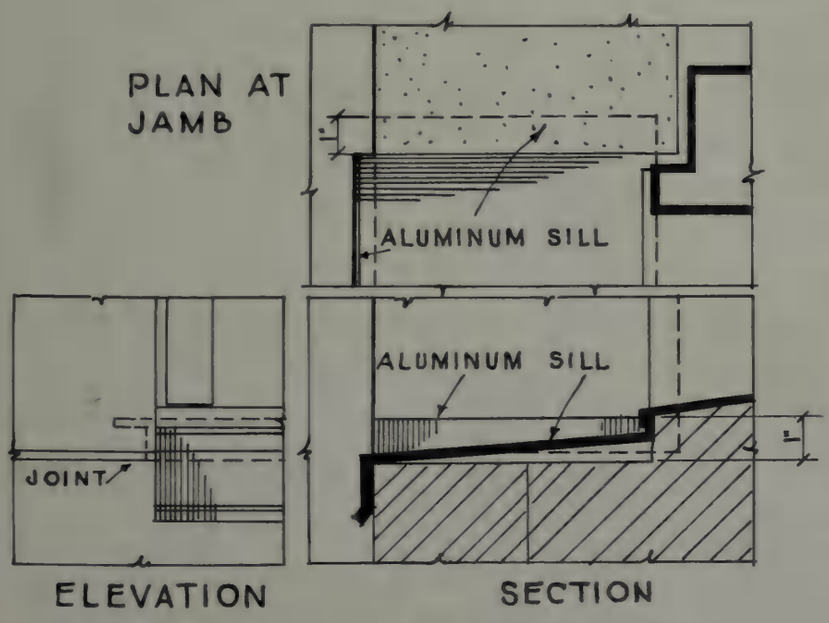
PARALLEL STRAIGHT-EDGE

Few draftsmen know that the parallel straight-edge attachment, now in general use, can easily be adjusted for drawing views or projections at an angle. Ordinarily, the draftsman does this work with triangles, which are not very accurate and which require more time than when working from a horizontal line. The parallel straight-edge can be pulled around to any angle from 1 to 30 deg. When this is done, the cord which extends along the top of the drawing board moves laterally. An indicating scale can easily be scribed on the board so that, when occasion arises to show a view at an inclination, the draftsman can pull the straight-edge around to the desired angle as determined by the scale and hold the cord in position with a thumbtack, working in the same manner as if from a horizontal line.—Morton Schwam, Philadelphia, Pa. From Engineering News-Record June 12, 1930.

GABLE ENDS WRONG AND RIGHT

Brick gable ends with corbelled tile for overhang may be detailed to eliminate wood crown mold. The flat tile should project the thickness of the end wall but not the brickwork. Heavy slate may be substituted for tile. (From the Architect's Journal, London, May 22, 1929)





DETAIL OF ALUMINUM SILL

WATERPROOFING SILLS

Sills may be of aluminum or stainless metal alloy, making stone or brick sills unnecessary. There are advantages to such construction as the sill may then be built integral with the sash and a more complete watertightness insured. Sills of extruded aluminum or alloy should be specified 3-16 inch thick, cast sills to be ¼ inch thick, with detail made by sash manufacturer



Photo. Underwood and Underwood

PLINY ROGERS

It is, perhaps, particularly fitting that I should write these few words in memory of Pliny Rogers, because he started his architectural work in our office some twenty-four years ago, when he came down from Cornell, and I think that with the exception of his immediate associates I was the last of the profession to see him.

We were building the Home Club on 44th Street in the fall of 1906 and were looking for a clerk of the works. Just how Pliny came to us I don't remember, but I do remember distinctly the very good impression he made in our first interview. He was a tall slender boy, rather reserved, with no practical experience, but very willing to try. It was a hard job for a beginner; a very complicated building, baths by the dozen, none over each other, as every floor had a different layout, and the owners had a way of going to Europe and cabling they had shifted their apartment from the fourth to the sixth floor, and they were most exacting in their demands. Pliny handled the situation well; saw to it that everything was done, and done right, and was most tactful in dealing with the clients. We have never had a better man. When the building was turned over he came in the office and I found, rather to my surprise, that he was an excellent draughtsman and had the makings of a good designer. He quickly picked up the manner of line drawing which I had learned from Bacon and Ross in the old McKim, Mead and White days, and became the best draughtsman we ever had. He left us after six years to go in with Mr. Litchfield and was for a time a member of the firm of Litchfield and Rogers, and practiced under his own name for the last four years. In partnership and alone he did much good work, a public library in St. Paul, a number of houses and apartments and an interesting development for the Government called Yorkship Village at Camden, New Jersey. His design was simple and restrained, thoroughly sound in every way; his knowledge of detail was profound, his taste uniformly good. And to the end he kept up his draughtsmanship; he made his own drawings mostly, and he took proper pleasure therein. I think, too, he had a good grasp of monumental work. I have several times urged him to go into competitions but he always seemed too busy in his other work to take the chance. If he had been stronger constitutionally I think he would have done it, and had he lived his proper span I have no doubt he would have made a great name for himself.

After he left us I saw little of him personally. Occasionally he would drop in and talk over some problem he had, or look at what we were doing. It was helpful to both of us. I only regret I did not see him oftener. He developed into a rather silent, reserved man, not assertive but fully able to hold his own with any one; not going out of his way to make friends but much esteemed by all with whom he came in contact; wrapped up in his profession and in his home; a fine man and a good architect.

EGERTON SWARTWOUT.

EDITORIALS

MAKE GRANDSTANDS SAFE

THE COLLAPSE OF GRANDSTANDS for school and college sports has been increasingly frequent since the war, according to the American Standards Association. The grandstand failures may be attributed to:

1. A desire to accommodate a large number of spectators in temporary grandstands at occasional sport events at a minimum cost.
2. Lack of regulations covering such structures.
3. The weakening of stands by repeated assembling and dismantling.

A large casualty insurance company has for ten years refused to insure grandstands of wood construction, and this naturally is the most common type of temporary stand.

In order to lessen, if not completely to eliminate, hazards to sport spectators, a national safety code is being prepared by engineers and experts in construction, under the guidance of the Standards Association. Architects concerned with athletic fields will wish to keep in touch with the recommendations of these engineers, which will be published in THE ARCHITECTURAL RECORD.

A. LAWRENCE KOCHER.

CRITICISM BY THE PUBLIC

FROM THE LAY CRITIC comes an increasing and lusty voicing of opinion on matters of design which will give, it is hoped, a healthy stimulus to the development of architecture. It is true that the more critical of the popular magazines, like the *New Republic*, the *Nation*, and the *American Mercury* with its articles by Lewis Mumford, have long been openly contemptuous of the tradition-bound products of the drafting room. The *New Yorker* has had its column by T-Square, privileged to comment on the various building activities of the metropolis. Occasionally a daily journal has been found criticizing in its editorial columns the prevailing architectural incongruities, and more recently *Life* and *Vanity Fair* have taken up the practice.

Now we find the interest of the layman extending beyond the completed building to the first published sketch. Culled from the press of the past month are two editorials, one appearing in *the new Freeman*, a liberal weekly, the other in the New York *Times*, both revealing the same skepticism.

Under the banner of "Form Follows Formula," *the new Freeman* article begins:

> On the same day last week, by a depressing coincidence, two important public building projects were announced, one to be carried out in the city of New York, the other in Washington, D. C. The designs furnished to the press establish the claim of the architects responsible for them to be congratulated upon their proficiency in archaeology. The design for New York was what Mr. Fiske Kimball might call a "superb restudy" of Kenilworth Castle. It will be a gift to the Metropolitan Museum of Art from Mr. John D. Rockefeller, Jr., and will rise above the Hudson in the superb park which Mr. Rockefeller has offered to the city. Since its purpose is to house the Museum's collection of Gothic art, a "restudy" of Kenilworth Castle will no doubt seem peculiarly appropriate to those who regard architecture as something to be borrowed from the past rather than created in the present. . . .
>
> The other design was Mr. Cass Gilbert's plan for the building which is to house the Supreme Court. It will stand opposite the Capitol, will be built in three years at a cost of $9,740,000, and is designed, we note with profound regret, to "last for all time." . . . For the Supreme Court Building he has chosen the Classic dress, Corinthian variant. There will be a middle section, with a portico at either end supported by Corinthian columns, which will quite effectually darken the interior. Flanking this will be two wings which will contain the offices of the Justices and the Court officials. The central portion of the building, which will house the Supreme Court Chamber and the main corridor, will, by a pretty conceit of the architect, "rise to a considerable height above the sections housing offices, as a means of symbolizing the relative importance of the various units." We had always thought that a work of art was in itself a symbol, and needed no associative symbolism to give it meaning. . . .

After labelling the Government buildings at Washington as being two-dimensional and dating back to the time when architects began to work from books, the article concludes:

> Mr. Gilbert's building will fit very well into this scheme of things, which is undoubtedly good enough for the Government architects, and probably good enough for the Government, but by no means good enough for America because it is not the best that American architects can do. And by the same token, neither is a restudy of Kenilworth Castle good enough—nor yet the imitation Classic design of the Memorial, lately approved, which is supposed to "embody the spirit of Theodore Roosevelt." For a country which had never produced any good buildings, an imitative, two-dimensional architecture might be condoned as better than nothing; but America is the country of the modern skyscraper. . . . of the modern factory-building, functional in design, austere and economical in detail; of the great elevators and other fine utilitarian structures which inspire admiration in foreign architects—who do not, by the way, visit this country to study the works of our archaeological school of architects, because they have plenty of these at home. . . . We regard it, therefore, as nothing short of a scandal and a national disgrace that important public buildings such as those we have mentioned are almost invariably turned over to architects whose originality is limited to choosing which of many antique models they shall copy, and whose relation to the present consists solely in the fact that they happen to live in it.

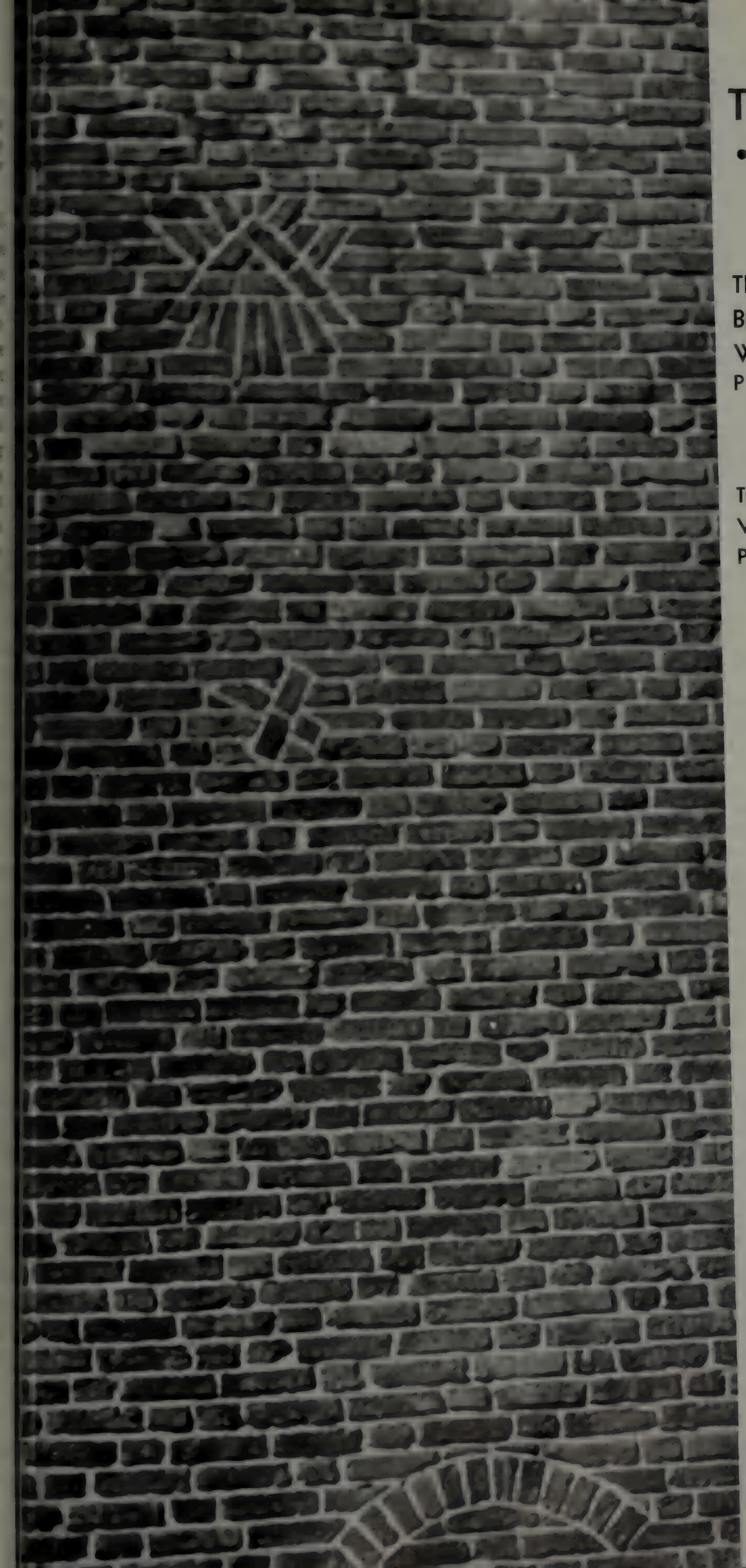
The *Times* editorial bears the caption of "Enduring Architecture" and also considers Mr. Gilbert's scheme for the Supreme Court building. Criticism of the design is by implication only; the discussion concerns the intended permanence of the structure:

> Not cheap ideals, then, but a definite philosophy, whether definitely realized or not, is behind the modern refusal to build for all time. . . . To raise buildings for all time is to impose ourselves on the future. It denies our posterity the right to express themselves in their own buildings in their own way. It fails to take cognizance of the speed of modern civilization, which in another fifty years may find skyscrapers for business offices giving way to the superior advantages of subterranean galleries electrically lighted and warmed by the new "fever tube."

Such a vigorous discussion of new buildings is to be welcomed. Far better for the architect and his building that the public should participate in its creation than that people should pass by, sublimely unconscious of defects and merits alike. In Europe controversies over projected buildings are quite customary not only among architects but also in the editorials and *vox populi* columns of the daily press. Ragnar Ostberg tells of the various attempts he made to design the tower for the Town Hall in Stockholm: several comparative solutions were evolved and published in the newspapers, and from the comments that followed the favorite was selected, revised and constructed in its final admirable form. More recently there has raged in the same city a schism between those who praise and those who dislike the functionally expressed buildings for the Swedish Exposition of 1930, designed by *Arkitekt* E. G. Asplund. Likewise in Holland and Germany one finds a keen public concern in what is happening architecturally. In these countries this popular interest is stimulated largely by the practice of the newspapers in employing professional critics to write frequent articles about new buildings in the same spirit in which the theatre critic reviews a new play.

Popular criticism of buildings is evidence of a growing demand for better structures. After all, since buildings are generally required to meet specific demands, it is for the architect to provide a solution that will satisfy these requirements. If he succeeds, the public which will use his building is best qualified to approve. If he fails and merely expresses his "soul" or "civilization" or any other convenient alibi, then also is it the public's privilege to condemn.

C. Theodore Larson.



TECHNICAL NEWS • AND RESEARCH

THE PROBLEM OF MAKING BRICK WALLS WATERTIGHT
Pages 77-86

THEATRE ACOUSTICS, VENTILATING AND LIGHTING
Pages 87-96-101

NEXT MONTH
WEEK-END HOUS

THE PROBLEM OF MAKING BRICK WALLS WATERTIGHT

BY STANLEY NEWMAN

*"One of the most important problems facing the building industry of today is probably that of leaking brick walls. The recent expenditure of over one hundred thousand dollars in trying to make a single building in New York City tight against rain gives some indication of the seriousness of the situation."**

POROSITY OF THE UNIT

The common conception is that the units composing a leaky wall are so porous that water passes through them. It is probable that less than five per cent of the trouble is from this source. Leaks are caused by a lack of continuity in the exposed surface or skin of the building. Water penetrates to the inside of the wall through cracks and holes and not through pores. If the problem were one of porosity, it would be a simple matter to seal the pores with a waterproof treatment. In our twelve years of experience we have never attempted to stop the entrance of water by the use of any such treatment alone. Pores can be waterproofed, but not holes or cracks.

The internal ventilation or "breathing" of a masonry wall not only assists in the process of drying after partial saturation, but increases its life, and it is therefore important that the units be of sufficient porosity to permit the air, under normal conditions, to take care of the moisture in the wall. Other things being equal, walls of medium porosity withstand the elements for a longer period than those of very low porosity, as a dense masonry dries more slowly. It is also well to remember that masonry units taking up moisture rapidly give it off rapidly; units absorbing moisture slowly give it off slowly. A dense wall is more affected by frost when subject to a sudden drop in temperature, as it contains more water in proportion to the porosity.

•

WORKMANSHIP

Good workmanship involves a thorough filling of all bed and end joints with sufficient mortar and the proper placing of the masonry units. These are the chief duties of the bricklayer. Yet where workmanship has been the cause of leaking walls, it has been due in most cases to lack of sufficient mortar in the end joints. The bed joints are usually fairly well filled, as it would otherwise be difficult to lay a stable and presentable wall. Since the joints constitute the most vulnerable portion of the surface, it must be borne in mind that a perfect bond between the brick and the mortar is most essential.

For all exposed walls subjected to wind-driven rain, the outside courses should be laid with shoved joints formed with a bed of mortar, a little thicker than the finished joint, by pressing the brick, or other unit, downward and sideways with sufficient strength to force the mortar into the end joints. Furthermore, additional mortar should be placed in the upper part of the end joint, and sufficient pressure exerted to force it out the full depth of the joint. In the backing, whether of brick or tile, a partial separation, or break in continuity, creating air spaces, is considered to make the wall more weather-resisting; it will dry out more quickly and is amply strong for ordinary loads. Porous back-up units reduce the chances of water reaching the inside of the building.

The real resistance of any wall, however, is found in the exterior course of masonry, and if the joints are all well filled—both bed and vertical joints—and a proper adhesion obtained between the mortar and the contiguous units, there need be no fear of leaks. It is very difficult to get masons to lay shoved joints, for a man's hand will be raw and tender if he is forced to shove all joints the entire day. Consequently, by eliminating this requirement in the back-up courses, there is a better assurance that the mason will shove all the joints in the veneer or exterior course. Neither is there any reason to believe that this practice will reduce the resistance of the wall.

The general specification that all masonry units should be wet before laying, except in freezing weather, is an essential requirement, provided that it is not indiscriminately applied to units that are dense and impervious. The hotter and drier the weather, the more water should be used. If porous materials are not wet, they absorb the moisture from the mortar, leaving an insufficient quantity for the proper hydration of the cement and lessening or destroying the bond between the mortar and the unit.

*Statement of F. O. Anderegg, conducting an investigation for the Eastern Face Brick Manufacturers' Association in cooperation with the Portland Cement Industrial Fellowship of Mellon Institute to determine the causes of, cures for, and prevention of leaky brick walls. *Journal of the American Ceramic Society*, Columbus, Ohio, May, 1930, page 315.

Many leaks are traceable to this source, and there is very little danger from porous brick being laid too wet, but as the wetting of the brick takes labor and makes it harder on the hands of the mason, wetting is often neglected, unless insisted upon by the builder. On the other hand, the units should not be soaked to the extent that they slide on the mortar bed, or carry an excess of surface water which will thin the mortar so that it may run down the face of the wall. Over-wetting also eliminates the proper suction necessary to draw the mortar into the pores of the brick and diminishes the bond between the mortar and the masonry; there is also danger that soluble salts in the brick may be dissolved and later brought to the surface where subsequent evaporation will cause efflorescence. A brick of low porosity should be immersed in water and immediately removed.

In cold weather the rate of absorption is lowered, and it is desirable to use a brick or other units of higher "sucking power." The width of joint should also be considered; a more porous brick being preferable when a wide joint is desired. Thin joints of one-quarter inch or less, when the work is done in hot dry weather, require a unit having an absorption rate of from one to four per cent in two minutes of immersion. In cold damp weather these values might well be doubled. For thick joints this rate should be doubled for summer work and quadrupled for winter work. The above recommendations are based upon the work of F. O. Anderegg at Mellon Institute, University of Pittsburgh, who was assisted by skilled mechanics. These results have also been checked by careful observation on a number of jobs.

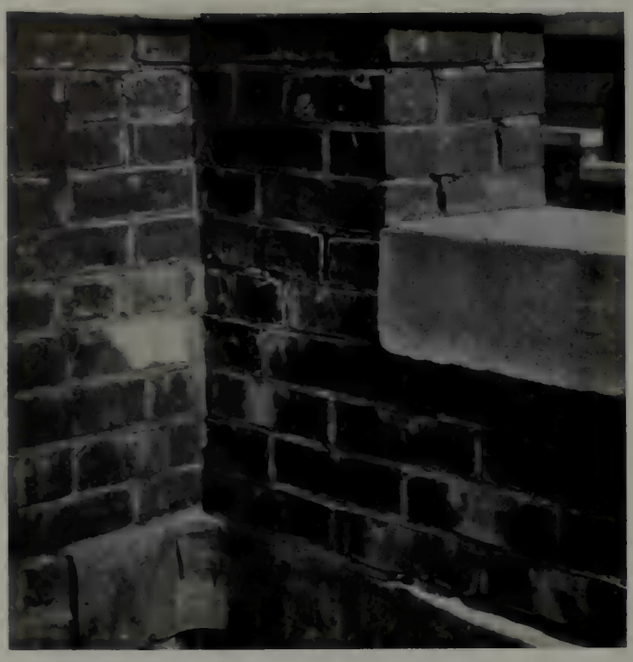
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THE MORTAR JOINT

As the total joints in brickwork constitute approximately one-seventh of the wall volume, it is evident that the type of joint plays an important part in the elimination of leaks in masonry. There are many cases on record where every detail was correctly specified and executed with the exception of the manner in which the joints were constructed, and this one feature caused leaking of the wall.

Cut-flush and raked joints, while they may improve the appearance of a wall surface by adding color and texture, are so difficult to properly construct that we recommend their elimination for buildings accessible to wind-driven rain. It has been our experience that in forming cut-flush and raked joints the tendency is to open up the body of the mortar and to draw the mortar away from the units.

The joints that afford the best protection are those of the weathered and concave type. These not only present an excellent surface for the shedding of water, but require for their formation an amount of pressure sufficient to compress the mortar and create a firm bond between the mortar and the brick at the face of the wall, thereby reducing the probability of hidden cavities.



Cracks in Parapet Caused by Improper Mortar and Insecure Bonding of Brick and Mortar

The size of the joint also is an important factor; wide joints cause considerably more trouble than narrow joints, due to the sagging of the mortar.

Many architects, for the sake of appearance, specify a mortar joint with a thickness of one-half or three-quarters of an inch; the latter has just three times as much shrinkage as one a quarter of an inch thick. Another disadvantage of a wide joint is that it is necessary to use a very dry mix, as the least amount of excess water causes a "bleeding" of the mortar. On the other hand, too dry a mix lacks sufficient moisture to hydrate the cement.

Other things being equal, the thinner the mortar joint, the stronger the masonry and the greater the resistance to the infiltration of water. Of course there is a limit to the thinness of the joint, but as long as there is sufficient mortar between the brick to fill all cavities and to bond the units, the purpose of the mortar is accomplished.

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THE MORTAR

Next in importance to the quality of the units that make up a masonry wall is the character of the mortar, or cementitious materials, which serve to bind these units together. The first masonry walls were brought together and properly placed without the use of a binder or mortar. One of the first binding materials to be used was lime. Today the practice on most operations is to use hydrated lime; this material has the advantage over quicklime that it

does not require slaking before being mixed with the cement and sand. The choice between the two types of lime is a matter of cost as excellent work can be done with either. In general it is a good plan to use a higher proportion of lime when laying brick having a comparatively high absorption. Every mason realizes however that the proper amount of lime added to Portland cement mortar increases its workability and causes the mortar to spread more readily.

It is doubtful if mortar is ever mixed for too long a period. On most operations a careful inspection will disclose a lack of homogeneity in the mixture. This condition can be so easily controlled and is so detrimental to the work that it would seem to be inexcusable. If masons could be made to realize the advantages in workability and future imperviousness to be gained by thorough mixing, there would be much less leakage through masonry joints. The present practice is to mix from one to two minutes. The latter should be an absolute minimum and some day it will be realized that the mixing period might be considerably extended. In fact we are told that some engineers recommend that the mortar be mixed for at least one and one-half hours.

Experience would indicate that most leaks are due to lack of resistance in the mortar joint. The following properties are necessary to insure proper resistance, assuming that the workmanship is good:

1. Plasticity—the quality of workability under the trowel.
2. Impermeability—the mortar must be of a suitable structure, when hardened, to resist the passage of water.
3. Adhesion—the ability to bond properly to the units.
4. Elasticity—the ability to resist stresses due to temperature, slight settlement and wind, without appreciable cracking.
5. Minimum shrinkage in the final setting of the mortar.

Besides the amount of water used in the mix the three chief factors determining the character of the mortar are: the cementing material, the aggregate, and the ratio between the two. The thoroughness of mixing is also important.

The ideal mortar should have both cohesive strength and bonding quality. Mortars containing a relatively large amount of cement suffer greater volumetric changes during hardening than the weaker mixtures. Wet mixtures suffer greater changes than those of drier consistency. In other words, mortar containing an excessive amount of cement or water, or both, shows a proportionately greater amount of shrinkage which tends to destroy the bond between the mortar and the masonry units.

The Portland Cement Association formerly made the following recommendations: "A proportion of one sack of cement to two cubic feet of sand will be found satisfactory under most conditions. A mixture containing in excess of three cubic feet of sand for each sack of cement is not recommended. Hydrated or slaked lime may be added to the mortar in an amount not exceeding 25 per cent by volume of the amount of cement in the mixture."

The new recommendations of the Portland Cement Association reduce the amount of cement and increase the amount of lime, and in a recent letter from the Association one part cement, one part lime and six parts of properly graded sand are now recommended.

Approximately these proportions have been successfully used by the foremost builders of industrial chimneys constructed of radial brick; the resulting mixture has a satisfactory plasticity and bonds well with the units.

It is interesting to note that cement mortar of average consistency has a much greater expansion than that of ordinary brick. A rich mortar of high cement content will give a greater initial shrinkage and less adhesion than one containing a lower amount of cement. It is the practice of many architects and engineers to specify a mortar of one part cement and three parts of sand with approximately ten to twenty-five per cent of hydrated lime.

With the greatly increased use of Portland cement during the last twenty-five years, there has been a radical change in mortar mixtures from lime mortar to cement-lime mortar; fire resistant buildings with bearing walls required mortar of sufficient strength to carry the superimposed weights; rich mixtures were used. Today most fire resistant construction is supported by structural steel frames, and it is not necessary to use such a high proportion of cement in the mortar.

J. W. McBurney in "The Effect of Strength of Brick on Compressive Strength of Brick Masonry," Proceedings of the American Society for Testing Materials, Vol. 28, page 605, states:

"Except where lime mortar was used, the typical failure of brick masonry at maximum load was by crushing of brick. Mortar 1: 1: 6 (one part Portland cement, to one part lime, to six parts sand) or stronger, was apparently uninjured."

According to this statement, it would seem that except for bearing walls the general practice is to use a larger proportion of cement than required for the purpose of strength. It should be remembered however that where bearing capacity is required, it is desirable to use a mortar of comparatively high Portland cement content, as the strength of masonry is closely associated with the strength of the mortar comprising the joints regardless of whether the mortar or the brick is stronger.

SAND

The old standard specification that the sand shall be sharp and clean should be changed to require a clean, well-graded sand with particles ranging from fine to coarse. The use of very fine sands should be discouraged and the size of the coarser particles should be as great as the width of joint permits.

The inspection of a leaking building, made several weeks ago, showed that a poor sand was the primary cause of the trouble. The material was too fine and contained a high percentage of loam, resulting in a weak and porous mortar. The porosity of the masonry units provided sufficient suction of the mortar and the proportion of sand to cement appeared satisfactory, but the mortar was so soft that it could be dug away with the fingernails. In this particular building the water was penetrating through the entire mortar joint and not confining its entrance to any shrinkage cracks between the mortar and the brick. The workmanship was of average quality and we feel that the whole trouble in this case was due to the sand. Even if money was saved by the purchase of this material, it was offset in labor, as the substitution of a cleaner, coarser and better graded sand would have reduced the cost involved in placing the mortar and made subsequent repairs unnecessary.

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FLASHING

Although the value of proper flashing can hardly be over-estimated, there is undoubtedly a tendency to substitute flashing for good construction. It would even seem as though some engineers and architects believed that sufficient flashing would eliminate all leaks and act as insurance against poor workmanship. In this connection it is worthy of note that in our entire experience we have never found that the flashing was the sole cause of trouble on even a single building.

On parapet wall construction we recommend a through flashing above the roof level that will take care of the entrance of water from either side of the parapet, carrying the water out onto the roof or down the face of the wall. If there is a cornice at the roof level, we recommend that the flashing also extend over the entire top of the cornice, all flat surfaces being either covered with flashing or flashed under, as such may not shed water with sufficient rapidity to prevent infiltration. Surfaces subject to any appreciable volume of water accumulating on roofs or decks should be metal covered. A base flashing of sufficient height above the roof is of course necessary to take care of water that accumulates on the roof.

Flashing on the back of the parapet, commonly known as sheathing, should not be used. If it were necessary to cover the back of the parapet, it would be equally necessary to cover the front. If we assume that the masonry will leak, covering the back of the parapet cares for only one-half of the surface through which water may be expected to penetrate. Furthermore the practice is actually harmful as the flashing material interferes with the ventilation of the parapet wall, and should a falling temperature occur after a driving rain, bringing the wall to a freezing point, it is probable that an accumulation of supersaturated masonry will freeze on the side that is covered by the flashing, causing a crumbling and disintegration of the surface. We have seen parapets where the brick had been covered with black asphalt and after a short length of time there was a considerable amount of spalling and breaking away of the brick from the wall. This was due to the fact that imperfect ventilation prevented the



Courtesy of Common Brick Association of New York and New Jersey

Leaks due to unequal expansion of stone and brick. Joint between brick and stone should be raked out ½″ to 1″ deep and filled with an elastic caulking compound



General Building Contractor

Disintegration caused by membrane waterproofing inside parapet wall which prevented "wall breathing"

water from being driven out of the side which had been covered with asphalt and subsequent freezing caused disintegration of the masonry. This same condition also occurs under copper flashing, but it is not usually observed because the copper hides the masonry. It is recommended that the inside of parapet walls be left uncovered and that a through flashing be placed at the roof level. We have seen cases where the back of the parapet is not covered with copper and where the frost had caused the brick to crack and spall, but in these cases the bricks were underburned and were not of good quality. Good bricks do not spall.

On an open parapet where a capping of stone is used, it is well to flash through under the stone in addition to through flashing above the roof material. This through flashing under the stone takes care of the water which flat surfaces retain. We should also recommend copper flashing under sills that are made of brick or very porous cast-stone, but if the sills are of granite with no dividing joints throughout their entire length, flashing is not necessary. This practice applies to any stone with a small amount of absorption and where there are no joints.

It should be realized that after through flashing is placed in a wall, the space immediately above the flashing is filled with masonry units and mortar, and it takes only a small amount of water to flood up to and overflow the turned up edges of the flashing. During a continuous, driving rain the water enters the wall through the many cracks and holes of the masonry joints above the flashing, and as these joints may number several thousand, it would be a physical impossibility for one bed joint above the flashing to carry off the water that is entering from the many joints above it. A driving rain has a wind pressure back of it which actually holds the wind against the side of the wall. A fifty-mile wind-driven rain develops a pressure equal to three inches of water.

Some persons believe that weepholes in addition to through flashing will solve the problem. These may help slightly, but the pressure of the wind during a driving rain may temporarily prevent the water from leaving the weepholes.

Let us consider two typical cases taken from our experience. Building No. 1 is situated on the Atlantic Ocean and built of fieldstone with two large chimneys extending well above the roof. The walls had leaked from the time the building was erected and three different attempts had been made to stop the leaks before our advice was requested. At the time we were called in the owner was considering a suggestion to take down the two chimneys to the roof level and flash through the masonry, carrying the flashing up several inches on the inside flue lining. This would have cost several thousand dollars besides an additional outlay for treatment of the main walls. The probable result would have been to eliminate leakage during a mild rainstorm up to the point where the copper would have overflowed. In a driving rainstorm of considerable length the water would have been concentrated at a single section, and after the saturation of the masonry had risen above the protective dam formed by the flashing, the owner would have discovered a leak he had never seen before. As a matter of fact, the chimneys were made raintight by attending to the joints and no additional flashing or hoods were necessary.

Building No. 2 is a church tower constructed of seam-faced granite. The top of the tower was de-

signed with a parapet, the back of which was covered with copper. The large and massive capstone was only partly flashed and the copper flashing was carried several inches under the stone on the roof side. This tower leaked from the time it was erected; the roofer was blamed for the trouble and payment withheld. He ran a number of tests by flooding the roof with water to a depth of several inches, but no leaks appeared. The next step was to take off the massive capstone as the owner felt that the leaks were due to water coming down through the stone. A copper flashing was then carried through under the stone; this should have been done when the building was erected. As the leaks still appeared after prolonged rains, the owner realized that the water came in through the exterior masonry. Many methods were suggested for stopping the leaks and over a period of five years three attempts were made to make these walls tight. With one attempt the owner received a guarantee, but the unfortunate part of a guarantee is that it does not offer a solution to any problem. After all of these worries and expenses the owner finally learned that the real cause of this trouble lay in the lack of a bond between the stone and mortar. Remedial treatment was confined to the joints which were cut out and repointed with the proper mortar to provide perfect adhesion to the stone units. The church is now as dry as could be desired.



General Building Contractor

St. Martin's Episcopal Church, Providence, R. I. Numerous experiments failed to make this building dry until the mortar joints were cleaned and repointed with the proper mortar

CONDENSATION

If plaster is applied directly to exterior walls of solid masonry built without air space or other insulation, condensation is likely to cause a film of water to appear on the inside surfaces. In some cases this causes the paint to "burn," blister, or saponify. Sometimes it is difficult to determine whether the burning of the plaster is due to condensation or to the infiltration of water from the exterior of the building. If the condensation follows a period of driving rains, the burning of the plaster may be due to either or both causes. This can sometimes be determined by examining the condition of the plaster in the areas which show burning. If the plaster back of the paint is not thoroughly saturated with water, it is a case of condensation, but if the plaster is wet, it could be either condensation or leaking masonry.

The fact that condensation causes a burning of the plaster is due to the priming coat having been applied to too damp a plaster or to the use of an oil in the priming coat that is susceptible to the action of the free alkali in the plaster. It is also possible that even though the priming coat be properly applied and unaffected by the free alkali, the finish coat may be of such inferior grade that the water of condensation will penetrate and cause a deterioration of the priming coat as well as of the plaster, and the absorption of moisture by the lime will bring about a chemical reaction forming a bloom or whiskers of calcium salts on the surface. As this salt is often hydroscopic, it may attract moisture even when the paint film in other areas is not affected.

FURRING

The inside of exterior masonry walls should be furred, except in climates where such has proven unnecessary or in locations where there is sufficient protection from wind-driven rains.

Although there are many cases of raintight walls which have been plastered directly to the interior of the masonry surface, the chances are that a furred wall will not leak so readily as one that has no air space between the brickwork and the plaster. Furring may be of wood, hollow tile, or metal, depending upon the type of construction and the local building ordinance.

In order to obtain air space in the body of the masonry, some specify hollow brick walls in which the face and the back-up brick are separated by a two-inch space and bonded together and metal ties laid in the mortar joints at proper intervals. The Rolok type of hollow wall in which the bricks are laid on edge and an air space left through the center has also been successfully used on numerous

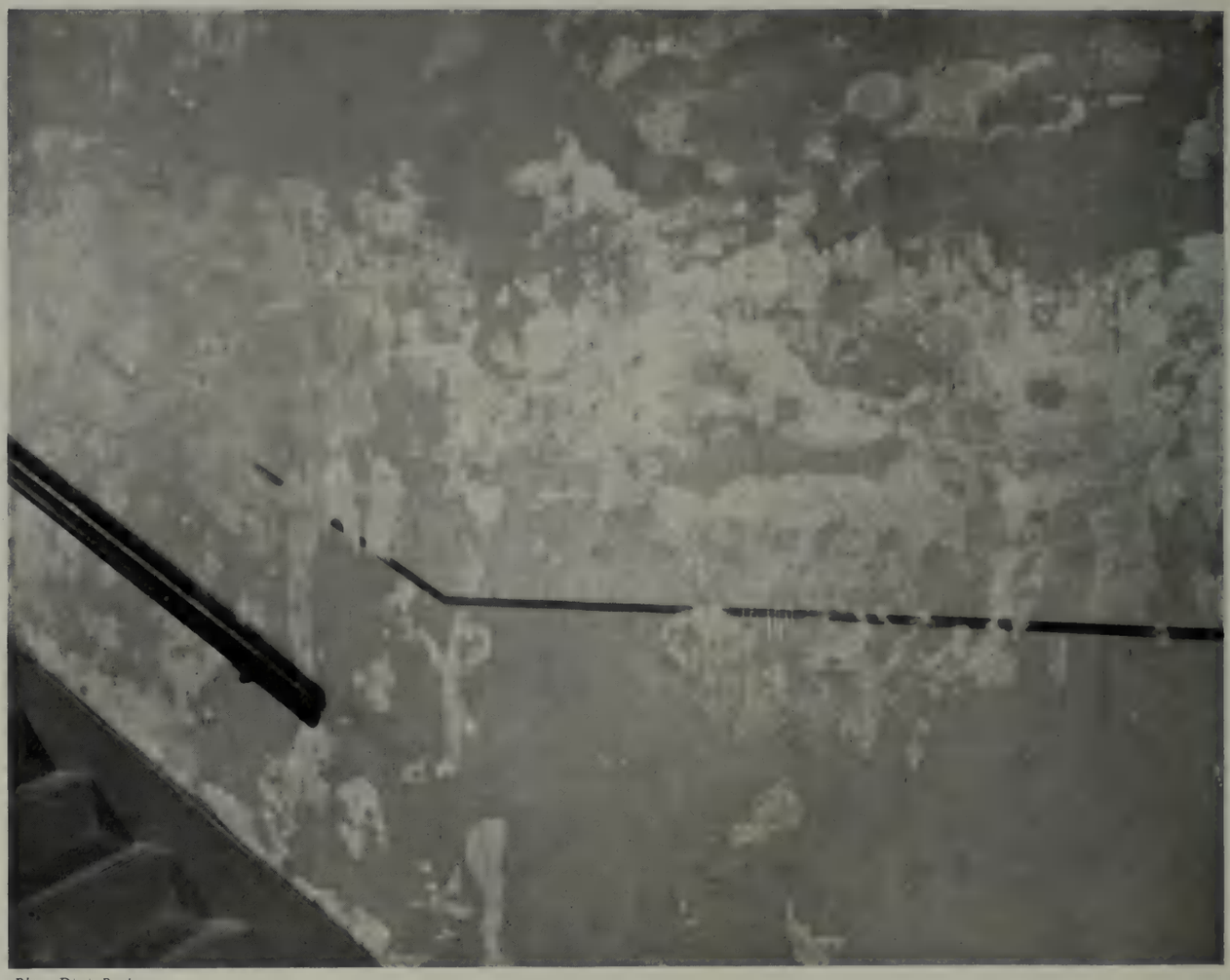


Photo. Dimit Brothers

Typical failure of plaster due to leaking wall, condensation or both. Better workmanship, membrane waterproofing and furring would help

operations. Many consider that walls of this type offer better insulation against cold and dampness, and they are used for the purpose of eliminating the furring, particularly for small residences. Experience however proves that the air space is apt to become filled with mortar and brick chips during construction, and that furring is a good insurance against condensation and leaks even when the wall is supposed to be hollow. When furring tile is used, care should be taken to avoid filling the space between the tile and brick with mortar as such would naturally lessen the insulating value of the construction. In many localities hollow tile back-up units have become the general practice for exterior masonry walls and give excellent results. An ordinary three-inch partition block also makes a satisfactory furring.

In locations subject to wind-driven rains, we should recommend that the inner surface of brick walls be damp-proofed before the furring tile is plastered. Damp-proofing however is of very little value unless the mortar joints have been properly pointed with a suitable mortar.

Although the Portland Cement Association has laid down a conservative policy in regard to furring walls built of hollow concrete units, it is regrettable that contractors take the chance of plastering directly on the inside of the block. As in the case of tile walls built of a single thickness of hollow tile, there are many cases where plastering directly has been successful, but this is not considered to be good practice.

A recent report submitted to the President of the Board of Education, New York City, contains the following statement: "It is of great importance that walls should be well built in the first place with good bricks and solid joints. A well-laid solid brick 12-inch wall damp-proofed inside, as an additional precaution against leakage, and then furred with hollow tile to prevent condensation, is most dependable."

ITEMS IN SPECIFICATIONS TO PREVENT LEAKS †

Bricks

This specification is applicable to common, solid or hollow (not face) clay brick of any of the following four classes:

V—Vitrified
H—Hard
M—Medium
S—Soft

Material and Workmanship. Brick under this specification shall be of clay or shale, be sound, of compact structure, reasonably uniform in shape, free from stones and pebbles that would affect their serviceability or strength, and without excessive laminations or warpings.

General Requirements. The standard size of brick shall be 2¼″ x 3¾″ x 8″, with permissible variations of ⅛″ in breadth or depth and ¼″ in length.

Bricks shall be delivered in good condition, with not more than 5 per cent broken.

At the completion of the absorption test the bricks shall show no evidence of disintegration.

Detail Requirements. The brick shall meet the following absorption and strength requirements for its respective class. The standing of any set of bricks shall be determined by the requirements in which it is lowest. Unless otherwise specified in the invitation for bids, medium (M) or hard (H) brick shall be accepted in lieu of soft (S) brick, and hard (H) brick in lieu of medium (M) brick.

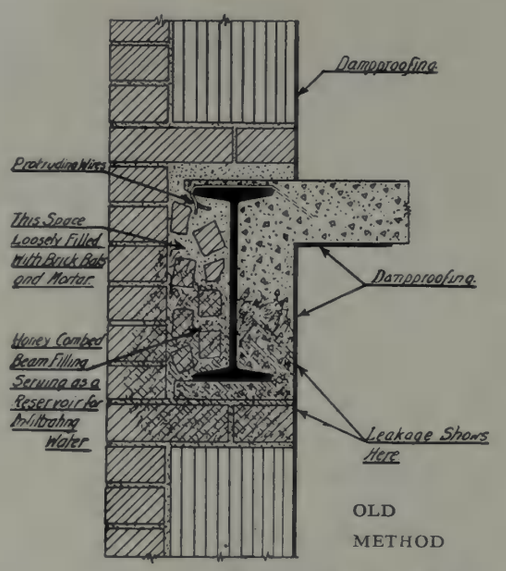
Brick should be of sufficient porosity to permit breathing or ventilation of the wall.

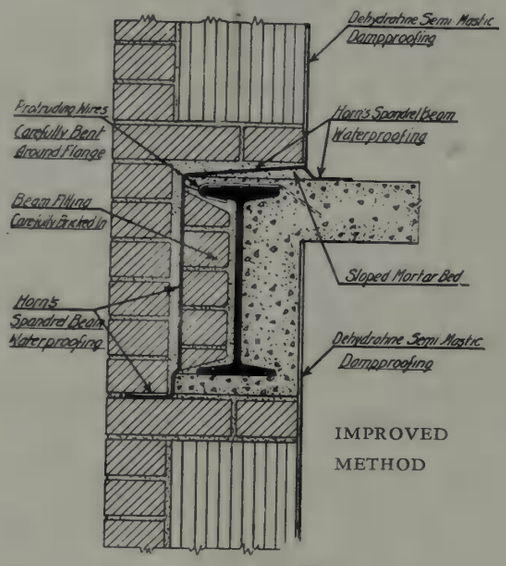
PHYSICAL REQUIREMENTS

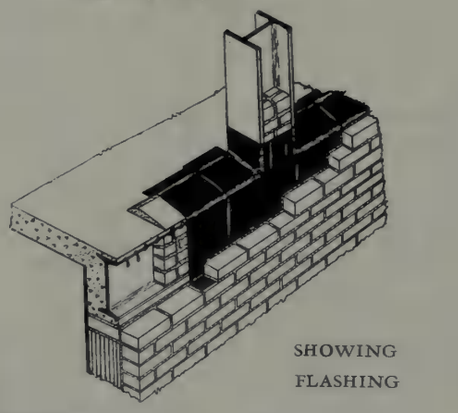
Class	Absorption Per Cent*		Transverse breaking load, Pounds, 7-Inch Span	
	Average of Five	Individual Maximum	Average of Five or more	Individual Minimum
V....	5 or less	6	2170	1450
H....	5 to 12	15	1080	725
M....	12 to 24	28	810	540
S.....	24 or more	no limit	540	360

* There appears to be a widespread belief that the percentage of absorption of individual bricks is a governing factor in the ability of brick masonry to resist moisture penetration. It has been conclusively shown that such belief is erroneous. If absorption percentage has any significance, it is as a possible measure of that quality of brick masonry known as durability.

† *Brick Engineering.* Vol. I, Pages 23, 24, 80, 81.







Courtesy of A. C. Horn Company

The area in front of spandrel beam, due to wall thinness, regardless of how well brick work is done, is a source of trouble difficult to prevent except with flashing. Furring and flashing at floor levels will not prevent leaks through structural cracks caused by movements of the structural frame but will generally prevent damage from water leaking in through these cracks

MORTAR

Portland cement and non-staining cement mortar shall be composed of 1 part cement, 1 part lime, to 6 parts of sand.

The proportion of lime should be increased for brick of high absorption and decreased for brick of low absorption. Also more lime should be used in summer than in winter.

Mortar shall contain ammonium stearate paste or . . . integral waterproofing in proportions as specified by the manufacturer.

LAYING BRICKS

Details of Brick Wall Construction. The face and common brick shall be shoved with full beds of mortar. No grouting nor buttering will be allowed, but all vertical as well as horizontal joints shall be thoroughly filled with mortar.

All brick forming the 4″ veneer shall be carefully laid 1″ clear of the outside diagonal sheathing, and care must be taken not to fill any part of this space with mortar. Every third stretcher in every fifth course shall be tied to the sheathing with galvanized Morse wall ties. Ventilate and drain the air space at the bottom by using 2″ drain tile. This drain shall be carefully formed and pitched to two outlets on each of the four sides of the house.

No part of the walls shall at any time be carried more than 4′-0″ above any other portion; they shall be stepped, or provided with approved anchors for connecting the sections.*

The mortar joints shall be of the weathered or concave type.

DAMPPROOFING INSIDE OF WALL

The following walls shall be entirely covered with..... applied in exact accordance with directions furnished by the manufacturers:

All exterior walls that have plastering applied directly on masonry.

All exterior walls that have brick facing. Paint shall be applied before facings are laid.

SPANDREL WATERPROOFING †

(*a*). *Bending Wires*

(This paragraph to be inserted in fireproofing specifications.) The fireproofing contractor shall bend all wires that extend past the outside of all spandrel beams so as to fit tightly against the underside of the beam flange. These wires shall be clipped so as to approximately reach the web of the beam when bent.

(*b*). *Spandrel Beam Filling and Mortar Bed on Top of Floor Arch*

(This paragraph to be inserted in the mason specifications.) The mason contractor shall fill in the space between the web and flanges on the outside of the spandrel beams and wall columns with brickwork so as to form a solid and smooth surface for the spandrel beam waterproofing.

On top of the floor arch and at its outside edge, this contractor shall also lay a bedding of cement mortar extending back at least 8″.

This mortar bed shall be sloped upward from the edge so that its thickness at the inside wall line shall be approximately and not less than 5/8 of an inch; this bed to form a base for the spandrel beam waterproofing to be applied later.

(*c*). *Waterproofing Spandrel Beams*

The outside of all exposed beams shall be waterproofed by the application of a membrane of.....

It shall extend through the entire wall and be carried in on the rough concrete floor at least 3″ beyond the wall line so as to lap on the wall dampproofing which will be applied later.

The membrane shall be carried down the face of the beam filling for depth and then out 3″ on first course of brick below bottom of beam.

All joints shall be lapped at least 3″ and well buttered.

The membrane shall be flashed up at least 6″ at the outside and two adjacent sides of all wall columns and on all faces of corner columns.

The membrane shall be applied in units approximately 3′ wide and of sufficient length to conform to the construction detail as specified above.

After the columns have been flashed as above described, the flashing around the corners shall receive a reinforcing strip of the waterproofing which shall be applied to the outside corners extending for the full height of the flashing and at least 3″ on each face of the column.

The membrane shall be pressed tightly against the underlying surface so there shall be no wrinkles.

This contractor shall co-operate with the mason contractor in order to properly schedule his work and avoid delays. All brick work, bending of wires, and application of mortar bed on top of the floor arch shall be done by others.

(*d*). *Dampproofing Solid Brick Walls*

The inside surfaces of all solid brick exterior walls, from ground floor level to pent house roof, shall be given a standard trowel coating of..... applied in strict accordance with the manufacturer's specifications.

(*e*). *Dampproofing of Hollow Back-up Tile*

The inside surfaces of all exterior walls having hollow tile backing from ground floor level to pent house roof shall be given one heavy, thoroughly covering coat of..... waterproofing.

* Due to the manner of operating brick gangs skilled corner men frequently lay up brick ahead of the side men, with the result that the corner work is left toothed, making it difficult to properly mortar the adjoining brick work when laid. Many major leaks occur in such locations.

† Horn's Specifications for Waterproofing Spandrel Beams. A. C. Horn Company, Long Island City, N. Y.

THEATRE ACOUSTICS, VENTILATING AND LIGHTING

ACOUSTICS*

Obtaining good acoustics is not just a problem of putting sufficient sound absorptive material into a theatre. **It is entirely possible to get too much sound absorption or to place it in the wrong location.**

Acoustics is such a complex science that it is impossible to give an empirical method by which the architect may assure a theatre having good acoustics. However, a few general rules and cautions may be given.

SHAPE AND SIZE OF AUDITORIUM

1. SHAPE

Experience shows that theatres varying from a floor plan approximately square to a floor plan having a depth one and one-half times as great as the width give equally satisfactory results when other conditions are equally satisfactory. No definite limits may be set, although it is obvious that this ratio must not be extended too greatly.

2. SIZE

The ratio of height to width and length is largely a problem to be determined as a factor controlling the volume. **If original speech is a controlling factor in the acoustic design, the volume should be as small as other conditions permit, but not less than an amount such that the total absorption offered by the audience together with the absorption of the construction surfaces, carpets, drapes and other absorbing materials, will indicate a time of reverberation less than the selected optimum for an auditorium of this size.** (See graph page 91.) All volume added to the theatre over and above that just required to meet the above condition must be compensated for at a rate of approximately four units of absorption for each one hundred cubic feet of volume.

In the design of theatres for talking pictures, the limitation imposed by loudness is not nearly as severe, since within proper limits additional energy may be employed at the source, over that normally produced by a speaker. The employment of sound projectors having directional characteristics may further improve the relative distribution of sound in a large auditorium. However, the ability to increase the energy for the sake of obtaining added loudness carries with it the penalty of increased duration of sound due to reverberation; and the concentrated energy employed to improve distribution may give rise to acoustic difficulties in improperly designed auditoria that might be tolerated with normal energy input. Under certain conditions, however, theatres that would be defective for original speech may be made reasonably satisfactory for reproduced speech by proper employment of sound projectors.

3. CURVATURE

Curved walls or ceilings should be avoided.

A curved surface acts somewhat like a curved mirror back of a source of light. It produces convergent, parallel or divergent sound rays depending on relation of the source to the centre of curvature of the surface. This in itself is a sufficient source of acoustical difficulty and when it is considered that the auditorium is bounded on all sides by other surfaces either plane or curved, which may act as reflectors to the beam reflected from the first surface, it is possible to have a number of sound foci, resulting in echoes and points of interference scattered at various points throughout the auditorium. (See Fig. 1.)

The "atmospheric" theatre is an exaggerated case of faulty acoustic design from this standpoint. Cycloramas of any curvature, especially when made of hard plaster, are to be avoided at all costs. The plaster cyclorama should have a plane surface except that a curve of short radius at both ends and top may be permitted.

> Mr. Clifford Swan, consulting engineer on acoustics states:
>
> "Many architects still cling to the idea of vaulted or domed auditorium ceilings and curved rear walls, but *curved surfaces* are always a potential source of acoustical difficulty. It is sometimes possible to introduce such surfaces without injury to the acoustics but they should be considered only after a careful scientific analysis of the problem."

4. REVERBERATION

Wallace C. Sabine presented for the first time a practical method for forecasting, within limits, the acoustic condition of auditoria by stating a simple formula involving a mathematical relationship between the volume and the total amount of sound absorbing material present. This relation is such as to constitute a measure of the "Time of Reverberation," or the time required for a sound of certain

*By G. T. Stanton, Assistant Acoustical Engineer, Electrical Research Products, Inc.

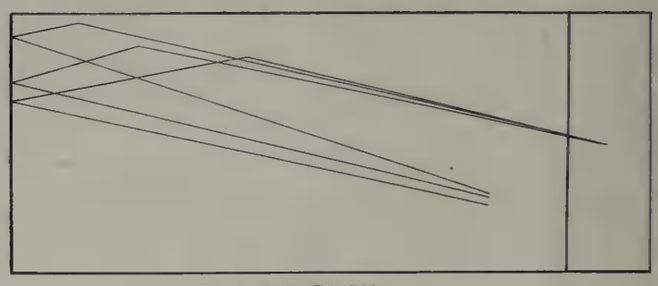
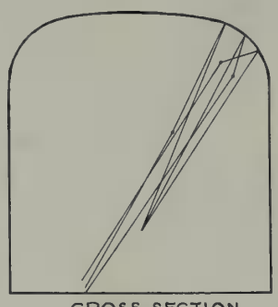
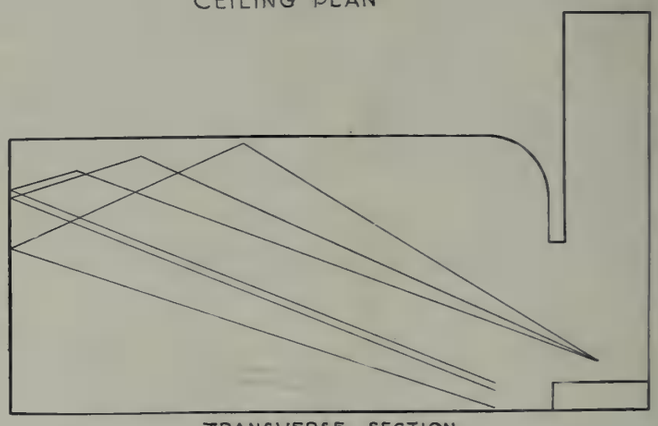


FIGURE 1.—REFLECTION IN THE ATMOSPHERIC TYPE OF THEATRE

The sound waves indicated reflect from the walls and ceiling and rebound against the rear wall to converge again near the front of the auditorium. The path taken by these sound waves is much longer than that of the direct waves from the source and consequently an echo results.

Sound waves falling on the forward portion of the ceiling will fall directly on the auditorium floor and their relative seriousness must be determined by a careful study of the specific auditorium.





specified magnitude to decrease in intensity until it can no longer be heard. The accuracy with which Professor Sabine's formula forecasts this factor reflects the painstaking nature of his work. However, the application of this factor presupposes certain conditions which may not obtain under the actual theatre conditions:

(a) The sound in question must persist for a period of time so that the intensity of sound is uniform throughout the auditorium.
(b) Sound must propagate equally in all directions.
(c) The material capable of sound absorption must be distributed with reasonable uniformity about the auditorium.
(d) The absorption must be in sufficiently small quantities to insure a moderately long time of reverberation. An improved formula has been offered in the past year by Dr. Carl F. Eyring which removes the latter limitation.

In addition it is essential to take into consideration the effects of changes in loudness, interference from extraneous sounds, echoes, and the effects of variations in the size of the audience.

RECENT DEVELOPMENTS

The modern approach to the science of acoustics is from the standpoint of what the ear must hear to be satisfied, and what must be done in the auditorium to obtain the conditions required.

The auditorium is considered to be a system for transmission of sound. The requirements of sound transmission in terms of auditorium acoustics are:

1. That a satisfactory loudness be maintained.
2. That there be no interfering noise introduced.
3. That the sound be unchanged or undistorted.

1. LOUDNESS

Loudness of speech is decreased as the size of the auditorium is increased, and as the amount of absorption is increased. These factors must be kept within limits that are determined by the loudness considered necessary in the most remote seats and are dependent upon the energy in the source of sound. The shape of the auditorium is also a factor since the energy reflected from the surfaces tends to increase the loudness in the auditorium.

2. NOISE

Interfering noise has two effects on hearing sound. One is the psychological factor of disturbance or annoyance which distracts the attention of the listener. The other is the physiological effect upon the ear which temporarily deafens more or less the auditor.

This latter effect is generally referred to as "masking," and in the presence of noise a greater degree of loudness of the original sound is required for equal articulation or ability to understand. The ability to understand begins to fall off as the loudness of the sound increases above a limiting level. **Noise therefore must be kept to such low levels as to not require an undue increase in loudness for good hearing.** In large auditoria the loudness, particularly for original speech, is generally the limiting factor in the permissible size of the auditorium, and any sacrifice in the effective loudness necessitated by

undue noise further restricts the permissible size of the auditorium.

PRINCIPAL SOURCES OF NOISE EXPERIENCED IN THEATRES

1. Mechanical equipment
 a. Ventilating equipment—blowers and driving motors, fans
 b. Booth equipment—projectors and driving motors—transverters and motor generator sets, noisy arcs
 c. Stage equipment—scene shifting
 d. Heating equipment—or combined auxiliaries with the ventilating equipment
2. Audience
 a. Walking in aisles and lobbies
 b. Conversation, coughing, etc.
 c. Restlessness while seated, seat noises
3. Noise created in other adjacent parts integral with the theatre building
 a. Elevators
 b. Dance Halls
 c. Bowling Alleys
 d. Industrial Plants
4. Exterior noise
 a. Street noises
 1. Through doors and windows
 2. Through structure
 b. Vibration noises
 1. Subways and Elevated RRs.
 2. Printing Presses
 3. General Industrial Plants

3. DISTORTION

The factors in an auditorium which cause distortion are:

a. Reflection of sound from surfaces at a time interval after the original sound too great for the ear to comprehend as one sound.
b. The absorption of energy at different frequencies or pitches in unequal amounts.

REFLECTION

Reflection of sound from walls and other bounding surfaces has two distinct effects. One is to increase the loudness of the sound throughout the auditorium and is helpful in articulation. The other effect of such reflections when they are delayed beyond a short interval of time is not to increase the loudness of a specific syllable or speech sound, but to act on the ear as an independent sound. If the individual reflection is intense and the interval sufficiently great an echo will result. Otherwise it will merely interfere with correct receptions of the desired sound.

The ear will accommodate itself to two similar sounds of equal loudness slightly displaced in time and hear them as one sound somewhat louder than either of the two parts. However, as the displacement in time between these sounds becomes greater, the increased articulation gained by greater loudness is more than offset by the loss in articulation due to confusion between the two sounds. Since the control of the relative intensity and consequent loudness and the time interval between the original sound and its successive reflections, are governed by the shape and acoustic absorption of the reflecting surfaces, the relationship of time of reverberation to acoustic quality may be seen.

UNEQUAL ABSORPTION

The ability of materials to absorb sound is dependent upon the frequency or musical pitch of the sound. In only a few specially constructed materials, generally not practicable for theatre use, is the sound absorption equal throughout the entire range of frequencies. It is obvious that if the total absorption in the room is greater at one portion of the frequency spectrum than at another, the composite sound heard by the ear (including the original sound and the energy reflected from the surfaces) will be relatively louder in that portion of the spectrum where the absorption is less. That is, if a material is used having high absorption in the range of the piccolos and low absorption in the range of the cellos, a duet by these instruments would sound unnatural, as the cellos would be louder relative to the piccolos than the artists intended. (See Fig. 4, page 92.)

The ear is not too critical of deviations, and considerable departure from an ideal condition is permissible. However, a very undesirable effect may be caused if the total absorption in the room is greatly different throughout the frequency spectrum. The condition of "dead" rooms is frequently due more to the fact that the high frequencies are more rapidly absorbed than others, rather than to the total quantity of absorption.

ARTICULATION

While some consideration should be given to the naturalness of speech, in general the principle requirement is that it be perfectly understood. The correctness with which speech is transmitted through any acoustic system, such as a telephone line, a radio system, or an auditorium, may be measured by determining the percentage of individual speech sounds that may be correctly understood when they are correctly produced. Such measurements represent the "per cent articulation factor" of the system; that is, if 80% of all speech sounds are correctly interpreted, the system has an articulation factor of 80%.

Such prediction may also be used in the future when a greater amount of empirical data is secured to establish limits of size and shape of theatres for each desired purpose. For the present, however, the employment of these factors directly in auditorium design is an intricate process, and a simpler method using time of reverberation and certain arbitrary rules is outlined, which should give a fair measure of

success in simple auditoria, and possibly be satisfactory in larger and more complex cases.

EFFECT OF VARIATIONS IN SIZE OF AUDIENCE

1. COMPUTATION

With the preliminary layout of the theatre completed, the number and type of chairs that are to be employed should be determined, the amount of aisle and other carpet estimated, and a computation made of the time of reverberation. This may be done using the Sabine or the Eyring formula. While the latter is somewhat more exact, the Sabine formula is simpler to use and should be satisfactory for present considerations if the desired time of reverberation is determined on a similar basis. For convenience, a graph (Figure 2) is included, on which is indicated various times of reverberation indicated as optimum for different houses by various authorities. These times of reverberation were either computed by the Sabine formula, or were measured under circumstances that approached the required conditions for accuracy of this formula. The range of values is rather large, being lowest where speech only is a consideration, and highest where music is to provide a major portion of the auditorium's use. From a comparison of the selected optimum time of reverberation and the computed time of the auditorium, the agreement between the two may be determined and the amount of additional acoustic absorption required may be determined.

Special consideration should be given to the acoustic characteristics of the chair selected. In auditoria where a variable audience is anticipated this becomes of primary importance in the quality of results obtained.

2. CHAIRS

The audience will comprise from 40 to 60 per cent of the acoustic absorption in the average theatre; and if its quantity is variable, the time of reverberation will fluctuate with changes in the number of audience. The only practicable method at the present time of overcoming this variability is to employ chairs, the seat and back of which offer a relatively high coefficient of absorption. Chairs are available that when empty offer absorption fifty to seventy-five per cent of that when occupied. The merit of employing such chairs is obvious from the attached graph (Figure 3), which indicates time of reverberation for different audience conditions of two typical auditoria having the same volume and seating capacity, and approximately the same time of reverberation at two-thirds audience, one employing high quality chairs, the other employing extremely poor chairs of the ordinary ply-wood type. The time of reverberation of the theatre employing wooden chairs is also shown, assuming that sufficient fixed absorption were added to reach limiting acceptable values for all audiences. The auditorium is then too dead for the normal conditions of more complete attendance and while acceptable, too reverberant for less than one-half audience. The use of the highly absorptive seat gives times of reverberation within plus or minus ten per cent of optimum for the majority of the conditions of attendance, and well within acceptable even when empty. For convenience, there is included in Table 1 the absorptive values of various standard types of theatre chairs when empty.

3. ACCEPTABLE CONDITION

Attention is directed to the use of an acceptable in addition to an optimum value. **A theatre should be designed so that its time of reverberation, in addition to being optimum at the largest average audience (which, lacking other information, may be generally assumed as two-thirds of the total), must be within at least acceptable limits for the smallest anticipated audience.** The type of theatre has much to do with the anticipated small audience. In motion picture houses other than the so-called "presentation" house, the first matinee performance may run as small as 15%. In the chart, Figure 2, there is indicated the limit of acceptable time for talking picture houses. This is a special case and is applicable as the poorest condition that may be considered commercially acceptable; and further applies only for sound reproduced by means of directional projectors. To specify definite limits of acceptability for each of the different classes of use of an auditorium is scarcely feasible, due to variations in the standards and requirements of the different houses. The tolerance or deviation from the optimum condition should be less for original production of speech than is indicated for reproduced speech and music. This must be given special consideration and in general, should be as near the optimum time selected as practicable.

REDUCTION OF EXCESSIVE REVERBERATION

If the time of reverberation, computed as above, is excessive compared with desirable values, there are two methods of attack:

1. REDUCTION OF VOLUME

This is particularly desirable where the loudness obtained from original speech is the controlling factor.

2. ADDED SOUND ABSORPTION

Materials having high values of sound absorption may be added to wall or ceiling surfaces, in amounts sufficient to adjust the time of reverberation to satisfactory values.

ABSORPTION COEFFICIENTS OF THEATRE CHAIRS

BACK \ SEAT		Plain wood seat	Panel of padded upholstery attached to wood seat		Upholstery and padding applied over springs	
			Leather	Velour	Leather	Velour
Plain wood back		0.2	0.7		1.1	
Panel of padded upholstery attached to wooden back	Leather	0.7	1.2		1.6	
	Velour			1.9	2.0	2.3
Fully upholstered padded back. No springs	Leather	1.1	1.6		2.0	2.3
	Velour				2.5	2.8
Upholstery and thick padding applied over springs	Leather				2.3	
	Velour				3.2	3.5

Adopted from data furnished by American Seating Company.

NOTE: * The absorption of mohair upholstery may be assumed to be the same as that of velour. Imitation leather is considered the same as leather.

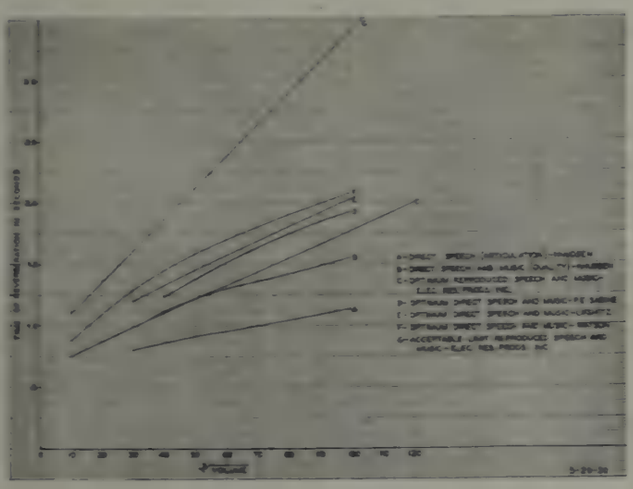


FIGURE 2

OPTIMUM AND ACCEPTABLE TIMES OF REVERBERATION

The above curves indicate suggested optimum times of reverberation, and an acceptable limit for a special case discussed in the text, of auditoria for different purposes. The times are plotted with respect to the cube root of the volume. The curves C and G are furnished by Electrical Research Products, Inc. The other curves are taken from various writings and publications of the indicated authors.

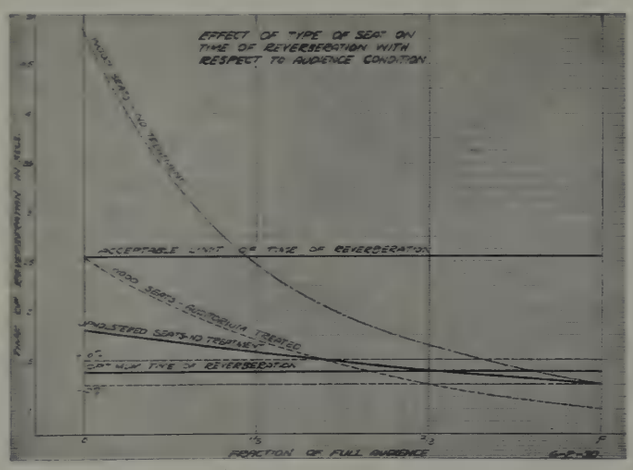


FIGURE 3

TIME OF REVERBERATION FOR DIFFERENT NUMBERS OF AUDIENCE

The curves indicate the times of reverberation for different audience conditions in a typical auditorium, having a volume of approximately 200,000 cubic feet. For the curve labelled "No Treatment" it was assumed that no specific acoustic treatment was added to the theatre.

TYPES OF MATERIALS

The materials available for introducing added sound absorption may be roughly divided into six classes:

1. DRAPERIES

Draperies for this purpose should be of a heavy, soft body, such as velour; and to secure the best efficiency of absorption should be loosely draped, in general utilizing at least thirty per cent additional material to cover the surface. Their employment in too large quantities is generally undesirable from an aesthetic standpoint, and the absorption is largely in the higher frequency range. Draperies may be flameproofed where required, although their absorption is, in general, slightly reduced by this process.

2. ACOUSTIC PLASTERS

Acoustic plaster is frequently applicable in new construction, as it may be used in lieu of the normal finish coat of plaster. The absorption coefficient of such plasters is relatively low, but since large areas are generally available for treatment, such as entire ceilings, they are frequently adapted. For surfaces where echo or concentration effects are anticipated, plasters are not generally suitable, since a material of high absorption is required. Since the efficiency of acoustic plasters is dependent upon the skill and care with which they are erected and surfaced, careful supervision of this work by a competent engineer must be arranged to insure that the erection is in accordance with methods known to produce the desired amount of absorption. Such plasters are of course "fireproof" within all building code requirements.

3. ACOUSTIC TILES

Acoustic tiles of various forms are available, many predecorated and others suitable for decoration after erection. For some types of interior treatment the tiles are a very helpful medium, since relatively high coefficients may be obtained and pleasing architectural effects produced. The acoustic tiles are available in various degrees of fire resistance.

4. FELTS

Hair felt is the oldest form of acoustic material. It is available today, as well as various modifications, including mixtures with asbestos fibre felts composed of jute and of wood fibre. In general, the felts must be employed in plaques or panels behind thin or porous draperies. The felt containing asbestos fibre is employed together with a thin membrane by one of the commercial companies to simulate ordinary plaster by painting the membrane after the felt is erected. Felts are inherently not fire-resisting. They are available in various degrees of fire resistance, from highly inflammable to reasonably resistive. Further objection is found to many forms of felt in that they offer breeding places for vermin and may produce undesirable odors in damp locations. Some felts are processed to remove these objections.

5. BOARDS

A number of common building boards have some absorptive value. They are generally inefficient, but have desirably uniform characteristics of absorption with respect to frequency. Their employment is not generally recommended due to difficulties in decoration, as they must be left unpainted or treated with special stains. The boards available for acoustic use are all inflammable. Any existing methods of fire-proofing destroy their acoustic properties.

6. SPECIAL

Newly developed materials are being added to the list continually. There is available a product consisting of ground paper and asbestos particles which may be sprayed on to the surfaces, where it is held with an emulsified asphalt. This material offers interesting possibilities and is reasonably fire-resisting, but is extremely fragile. The employment of porous cinder blocks, leaving the interior surface unpainted or sprayed with special acoustic paints, offers possibilities for development. Various contractors utilize special systems and combinations of systems to gain the desired results.

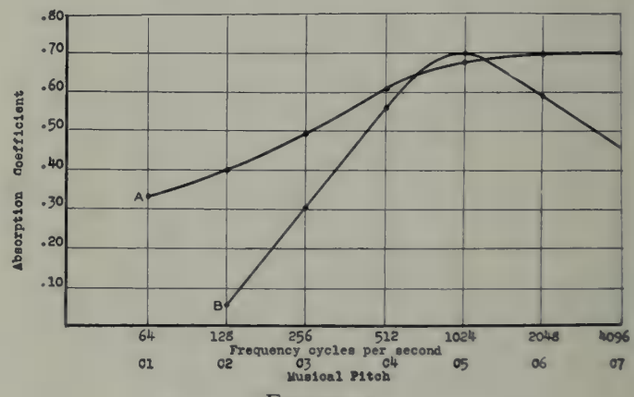


FIGURE 4

COMPARISON OF THE ABSORPTION FREQUENCY CHARACTERISTICS OF TWO COMMERCIAL SOUND ABSORBING MATERIALS

Curve A represents a material having characteristics considered excellent. Curve B indicates a material which, while highly efficient at 512 cycles (the frequency most commonly employed in computations), has an absorption frequency characteristic considered poor. (It may be noted that the absorption at 1024 cycles is over ten times that at 128 cycles.) This latter frequency is about that produced as the basic pitch of a male voice.

SELECTION OF MATERIALS

In the selection of a proper material consideration must first be given to the locations which require treatment and other surfaces that are available. The surfaces upon which concentrated energy from sound projectors may be incident should be treated with an efficient material. Consideration should then be given to the necessary coefficient for the remainder of the material necessary to obtain the required amount of absorption. The decorative requirements should then be considered, selecting a material which meets the above requirements. The absorption frequency characteristics should then be compared and primary consideration given to that material having the most nearly uniform characteristic.

HEATING, COOLING, AND VENTILATING THE THEATRE*

Increasing demand for physical and psychological comfort has made the heating and ventilating of the modern theatre a problem of complete air-conditioning.

Data collected by the American Blower Corporation show that in an uncooled theatre the average weekly attendance is 64,905 for all months with the exception of June, July and August. In June, July and August the average weekly attendance is 51,582, a drop of 13,323 paid attendance per week during the three hot months. In a cool theatre the average weekly attendance for all months with the exception of June, July, and August, is 58,373, while during June, July, and August, the weekly attendance is 59,300.

A satisfactory system of air-conditioning must automatically control air volume, air temperature, relative humidity, air motion, and air purity. The requirements of the legitimate theatre and the movie theatre present two distinctly different problems. The legitimate theatre is seasonal, occupied about three hours at a time, usually after sundown, and closed during the hot summer months. The movie theatre is occupied, often to full capacity, for twelve hours per day every day in the week and all year round. The air-conditioning plant must be able to meet the requirements of the two extremes of outside weather conditions. The volume of air to be handled in the movie theatre is therefore often more than twice the volume required for the legitimate theatre.

A. AUDITORIUM

The warming of the auditorium is really a deheating problem. The heat radiated from the occupants of the seats and from the lights usually exceeds the heat loss through the walls and the roof of the building even in the winter time. The removal of the excess heat and moisture can only be accomplished through a complete ventilating system; and the fresh air must be admitted at a temperature lower than that of the room to effect the necessary cooling. (A typical case for winter conditions might show 300 B.t.u. of body heat, plus 100 B.t.u. per person from lights, etc., being given up to the building, against 200 B.t.u. heat loss from the building, per person per hour. This would mean that 200 B.t.u. per person per hour must be carried away by the ventilation.) The quantity of air to be supplied and removed by the ventilating system is determined by the number of persons to be seated in the theatre. Desirable standards vary from 25 to 30 cubic feet of air per occupant per minute.

1. SYSTEMS OF DISTRIBUTION

It is important that the conditioned air introduced in the auditorium be distributed evenly with respect to the amount of heat to be absorbed in the various parts of the room. Three methods of distribution can be used.

a. Ejector System. The conditioned air is introduced through a series of ejector nozzles near the ceiling and the underside of the balconies in the back of the auditorium, discharging horizontally at high velocity. Losing speed, the air moves down and is removed through exhaust grilles located near the floor at the back of the auditorium. **This system is the cheapest in initial cost and insures an effective mixture of the air in the auditorium. It cannot, however, be used where the ceiling and the underside of the balconies are beamed or have protruding forms that would interfere with the air current.** The advantages of the downward air movement will be discussed below.

b. The Upward System. The air is introduced through mushroom hoods in the floor and exhausted through the ceiling, utilizing the natural upward rise of the air after it has absorbed the heat radiated from the seated persons. **This system is not generally used. The air has to be introduced at a low velocity in order to avoid draught; and the two features that cool air strikes the feet and that the body odors and dust are carried up with the air are objectionable. The use of mushroom hoods furthermore necessitates an expensive system of air-tight chambers under the floor.**

c. The Downward System. The conditioned air is projected horizontally into the auditorium near the ceiling or through diffusers in the ceiling against a horizontal baffleplate and spread evenly over the whole upper area of the auditorium, mingling uniformly with the air in the room. Moving down, the air absorbs outer heat transmitted through the walls and the roof and the heat emitted by the occupants of the seats, and finally reaches the desired temperature and humidity before it strikes the seated persons. The air is then removed through exhaust

* By K. Lönberg-Holm.

outlets near the floor. The moving force of the inlet fans makes the upward effect of the heat from the people negligible.

B. LOBBY

The lobby and foyer can usually be included in the general air-conditioning system. Additional banks of direct radiation in recesses near the doors, or a special fan system discharging through grilles at each side of the doors, should be installed to insure quick heating and to prevent cold air from being blown into the auditorium. If there are two sets of doors in the lobby both sets of doors should be equipped this way.

C. STAGE

Sufficient radiation should be installed to prevent air currents in the front part of the auditorium from interfering with the air-conditioning system. The radiation should be evenly distributed and special provision should be made for exterior doors leading to the stage. The wall radiation is usually placed at two or three levels on the exposed walls, and additional heating coils provided in the skylight, and immediately above the proscenium opening.

D. PROJECTION ROOM

The projection room can be included in the general air-conditioning system but should have a separate exhaust system for the projection machines, to protect the film from contact with dirt-laden air.

E. DRESSING ROOMS, TOILETS, REST ROOMS

These rooms can be included in the general system. If necessary, additional direct radiation is installed on exposed walls. The toilets should be equipped with separate exhausts.

F. RECIRCULATION

A saving of up to 50% in fuel consumption can be effected through recirculation of a portion of the air used for the air-conditioning system during the winter. The recirculated air should be cleaned before it enters the distribution ducts.

G. COST DATA

Approximately 75 to 100 tons of refrigeration are required per thousand people.

A complete ventilating plant with refrigeration will cost from $200 to $800 per ton of refrigeration.

Initial expenditures are approximately $35 per seat. This includes a complete conditioning system with refrigeration machine. Cost of operation per day per seat throughout the year averages between 3 and 3½ cents. This includes depreciation, engineer's salary, power, steam, water, interest on investment, and all incidentals. Naturally the cost of operation during the winter is much less than in the summer.

Assuming that each seat is occupied at least twice a day, the cost per ticket is slightly over 1½ cents. The system replaces the ordinary heating, air-washing, and fan system that might be installed.

Estimating the maintenance of this system at 2 cents per day per seat, brings the additional cost of the complete air-conditioning system down to 1 cent, or ½ cent per expected patron. The difference per day per 1,000 seats is approximately $15. A daily sale of 43 additional tickets at the low average of 35 cents absorbs this excess.

LIGHTING FOR MOTION PICTURE THEATRES

The following suggestions are from an article on "Theatre Lighting"* by Frank Cambria** and Francis M. Falge.***

There should be a well-planned, single-circuit system of illumination for lobbies, foyers, rest rooms, etc., which should be graduated in intensity from street to auditorium.

Lobbies should be bright and cheerful.

Many small bright sources of light are pleasing for lobbies.

Foyers should be of lower intensity with soft colored lights.

Rest rooms should be colorfully and comfortably lighted.

There should be a specially planned and controlled system of auditorium lighting, making possible the advantages of mobile color and of a variety of effects. There must also be a comfortable, glareless system for the showing of pictures.

There should be no bright light sources near the line of the vision of the picture.

Stray light should be eliminated from the picture sheet as much as possible.

Sufficient light should be provided so people may easily locate seats, and so that accidents may be eliminated.

Sufficient light should be provided to discourage undue familiarity, but not so much that patrons are distracted by the movements of others.

Aisle lights and side-wall brackets should be on separate circuits, controlled from the stage switchboard.

Cove circuits should be carefully planned for many variations of quantity and quality of light. They should be on dimmers.

There should be a carefully devised emergency lighting system, separate and distinct from the other lighting arrangements, connected with storage batteries as per building code.

* A paper presented before the Twenty-third Convention of the Illuminating Engineering Society, Phila. Sept. 1929. November issue of *Transactions of the Illuminating Engineering Society*, 29 West 39th Street, New York City.

** Director of Art and Stagecraft, Publix Theatres Corp.

*** Lighting Specialist, Publix Theatres Corp.

Local, state, and federal codes must be strictly adhered to.

There should be a separate lighting system for cleaning, preferably a permanent one, but at least including portable lights and conveniently located outlets.

It is preferable to have concealed units of high intensity which are operated by a switch.

This should include supplementary lighting for passageways and other places which might be included with other circuits not needed for cleaning.

It is highly desirable to arrange the lighting of the motion picture theatre so that the eyes of the patron entering the theatre are not subjected to any sudden and great change in the illumination. If the change from the exterior to the interior levels of brightness can be made gradually and extended over an appreciable period, the adaptation processes have time to operate, and the person entering will be able to see comfortably at the illumination level existing within the auditorium. From the measurements of illumination and brightness, it is possible to trace the decrease in brightness level as the patron passes through the various entrance areas. In the accompanying table are tabulated some of these values in a way calculated to illustrate this brightness decrease in the case of a person entering the theatre through the main lobby, orchestra foyer, and on into the central portion of the main floor.

IN MAIN LOBBY:		
Just Inside Entrance	(Thirty-inch plane)	15.0 f.c.
Centre of Lobby	(Thirty-inch plane)	2.0 f.c.
Near Orchestra Foyer	(Thirty-inch plane)	1.0 f.c.
Mean Wall Brightness in Lobby		2.0 ml.
MAIN VESTIBULE:		
Just Inside Door	(Thirty-inch plane)	.23 f.c.
Under Main Lamps		.16 f.c.
Mean Wall Brightness		1.6 ml.
ORCHESTRA FOYER:		
Just Inside Door	(Thirty-inch plane)	2.0 f.c.
Directly Under Lamps		.53 f.c.
Near Entrance to Aisle		.09 f.c.
Mean Illumination	(Thirty-inch plane)	.20 f.c.
Mean Brightness of Vertical Surface in Field of View		.25 ml.
CENTRAL PORTION OF MAIN FLOOR, Seat Q-107:		
Illumination on Thirty-inch Plane		.04 f.c.
Illumination on Program at 45 degrees		.06 f.c.

The experience gained from numerous installations indicates that where an auditorium is decorated in silver-leaf and light colors, 10 watts of lighting in each color should be provided for each seat. Where gold-leaf and warm or heavy color decorations are adopted, 20 watts in each color should be provided for each seat to afford "reading" illumination. In urban motion picture theatres, where "reading" light is not required, satisfactory lighting has been effected with as little as 4 watts, each color, per seat.

A. LIGHTING THE ATMOSPHERIC THEATRE *

The illumination of the atmospheric theatre is by far the most important single factor, for the lighting results will in most cases determine the success or failure of the entire project. In a true atmospheric theatre, the auditorium is in reality a permanent stage setting of large dimensions. The aim of the architect is to create an exterior scene taken from some distant land, such as a Spanish courtyard, in which the patrons are seated. The illusion of the open sky is created almost entirely by artificial lighting from concealed equipment. In addition, the general architectural theme must be revealed while the house is in comparative darkness. Here again skillfully located lighting equipment is of the utmost importance.

The evening sky effect, which includes twinkling stars in a field of deep blue across which drift fleecy clouds, is the major theme of the lighting scheme.

For the blue of the sky, continuous reflectors are installed in a cornice or equivalent structure at the imaginary horizon. The ceiling is shaped to approximate, as closely as conditions will permit, a hemispherical canopy. At the point of intersection of the "horizon" it is kept as far back as possible to suggest indefinite origin. An impression of greater depth is secured by giving the ceiling the texture of a "scoured" finish. Great care must be exercised to keep the ceiling surface absolutely even, for this type of illumination greatly accentuates any unevenness. The ceiling should be tinted a *flat pale blue*.

The so-called "natural" blue glass lamps should be used, spaced 12 inches apart around the four walls of the auditorium in a continuous type reflector. Even illumination without "spotting" is highly essential. In addition to blue lamps, amber and red are often used to create special effects such as a sunset during the overture or similar features.

Illuminated stars are secured by placing low candle-power lamps in cone reflectors back of perforations from ⅛ to ¼-inch in diameter in the ceiling. These lamps are connected to flashing devices to cause a few stars to flash at a time. With the proper ceiling with deep blue illumination, these stars are startlingly realistic. The perforations are laid out to scale to represent the respective positions of the stars in the firmament. The Great Dipper comes in for its usual share of attention.

"Effect machines" of the rotating disk type, concealed in the side walls, project slowly moving clouds across the ceiling. With a well designed ceiling, these clouds actually appear to be at a considerably lower level than the ceiling, which greatly adds to their effectiveness.

Auxiliary lighting equipment concealed in the structural work serves to reveal the dominant architectural features such as arches, columns, and niches.

* A. L. McCABE, Chief Engineer, *Erickson Electric Co.*

This part of the lighting design is of great importance due to the fact that the general illumination of the entire auditorium is necessarily kept at a low level during a major part of the show. Concealed lighting for the organ grille and wall niches from colored lamps in strip reflectors is particularly effective.

A variety of color should be used in the various locations to add interest to the general effect. Amber lamps in shielded wall bracket fixtures, together with a generous use of aisle lights, provide the necessary "working" illumination.

Wall brackets, aisle lights, steplights, and exit lights, are connected to an emergency storage battery system by an automatic throw-over switch in case the building current should fail.

Flush ceiling fixtures or lunettes are provided under balconies and in similar locations where the height prohibits the use of indirect lighting. Through the use of colored light, the general effect can be preserved.

Dimmers are provided on each group of circuits to afford a smooth blending of the various colors as well as to change the level of intensity. All stages of illumination, from mysterious moonlight to the effect of sunshine, may be produced at will.

B. WALL AND CEILING WITH COLOR LIGHTING

The latent possibilities of projected beams of light as compared with pigments for purposes of producing decorative effects have not yet been fully explored.

The walls of the auditorium of the legitimate or movie theatre can be painted a plain white or cream and all decorations may be obtained by shadow or mobile color lighting.

It should be borne in mind that, while the means for obtaining effects are simple and the colors are thrown on a plain background, the effects which can be obtained, both of form and color, are almost limitless.

THE CHARACTERISTICS OF COLOR LIGHTING

From the standpoint of the physicist the image one gets when looking at a painting is composed of the light rays (from sun or artificial light) *less* the light rays absorbed by the pigments used in the painting.

Color effects may be obtained without the use of pigments by, first, absorbing the light rays not desired by a color screen near the observer (stained glass windows), or a color screen near the source of light (stereopticon or movie); second, refracting light into spectral colors with prisms; third, producing color effects through the use of various mediums for producing light (vapor lighting systems, etc.). The stained glass windows, stereopticon, color movie, crystal prisms, diamonds, or even rain drops (rainbows), produce emotional reactions difficult to duplicate with paint.

COLOR LIGHTING ESPECIALLY SUITABLE FOR USE IN THEATRE AUDITORIUM*

Due to the ability to vary the effects to coincide with the type of play and the varying moods of the play, the use of color lighting for decoration of walls and ceilings is especially suitable for theatres.

In decorating the auditorium care is to be taken that during the performance nothing conflicts with the main interest, which is on the screen. It is during intermissions that decorative lighting of the auditorium should be featured.

There are two large groups into which decorative lighting is divided: shadow lighting and mobile lighting. The first makes use of geometrical and conventionalized patterns which may be varied by dimming and changing colors. The second is more abstract, more flexible, and is characterized by a continuous sense of motion and depth.

Shadow Lighting

Color shadow lighting projects beautiful harmonizing forms on either ceiling or sidewall, or both.

Color shadows can be projected either from coves, fixtures or pedestals. The source and placing of the units can best be determined from actual experiment.

As a rule, reflectors are undesirable, as the best color shadows are projected from the clear bulb—a point source of light being the ideal source. In most cases, reflectors tend to fuzz the edges of the shadows and to detract from the design, although in some cases reflectors are of material assistance in securing the effect desired. The recommendations in each case must be the result of experiment; there is no rule of thumb that is reliable.

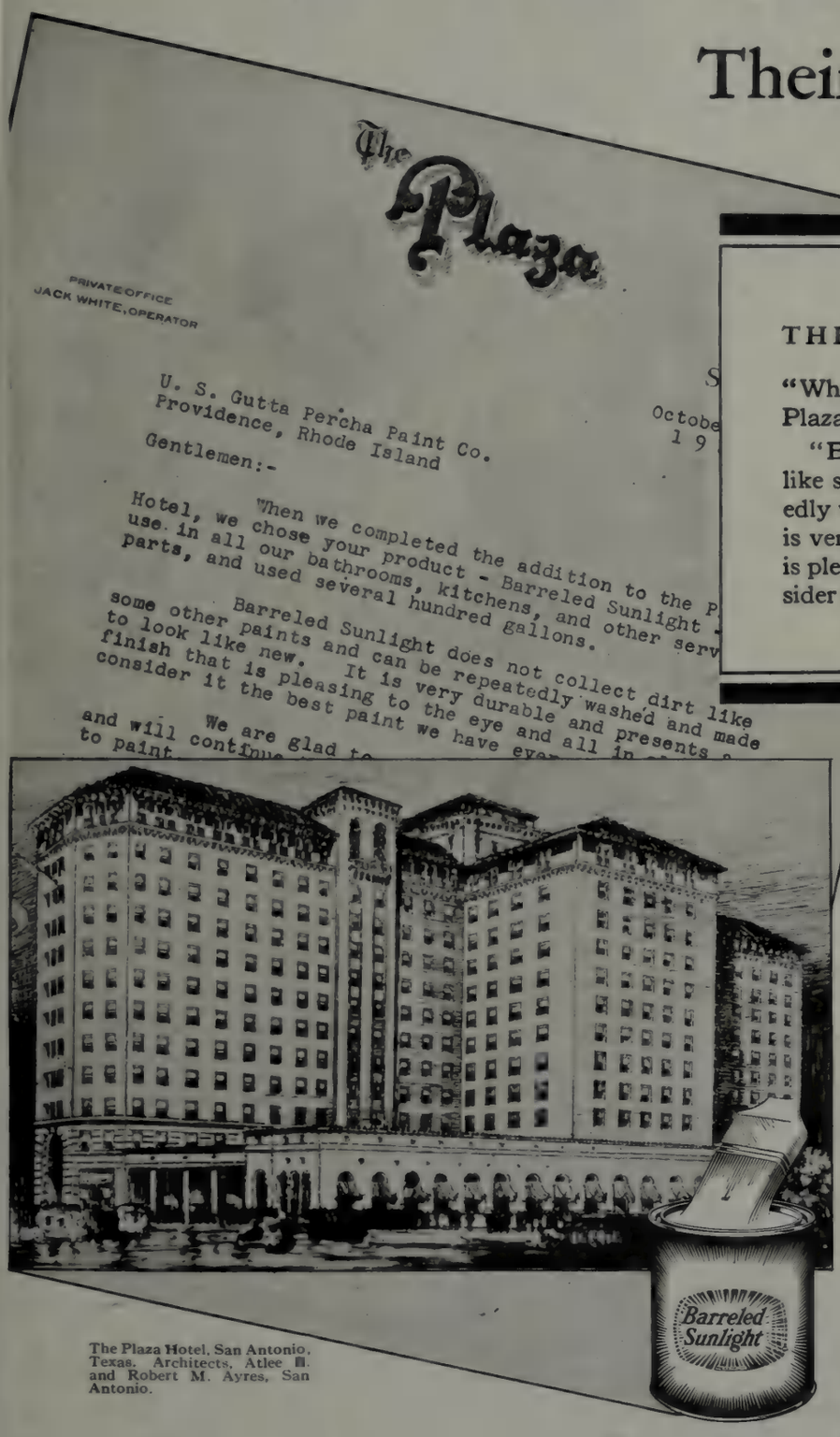
A cove can be so designed that the lamps which produce the color shadow effects also illuminate the room, or the color shadow lamps can be supplementary to the standard cove lighting layout.

With fixtures, a definite pattern can be projected on the ceiling in white light leaving black shadows. Color lighting from standard interior equipment then lights the shadows in solid or blended colors as required. Another type, experimental samples of which have been very successful, is to have only the standard interior color equipment in the fixture and then have an intercepting screen of open work design suspended from the ceiling in the form of a drum. This design is projected in long shadows of various colors which change color and shape as the various sources are dimmed and brightened.

The most effective colors are red, blue, and green. These can be mixed in the proper proportions to produce a white field and then broken up by the intercepting screen. This introduces an element of mystery which always appeals to the lay mind. Amber does not seem to produce effective color shadows and interferes with the other colors. For this reason, it is not recommended.

* *Memorandum*, Curtis Lighting Co., Inc., Chicago.

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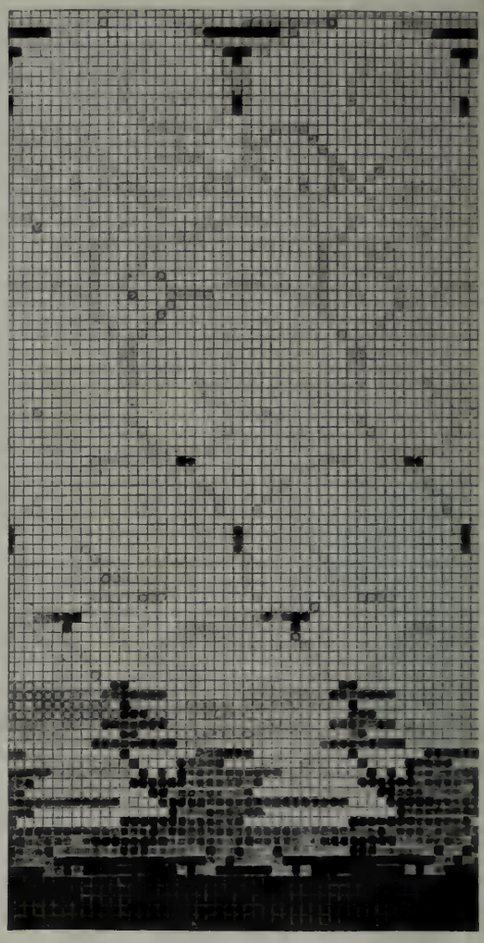
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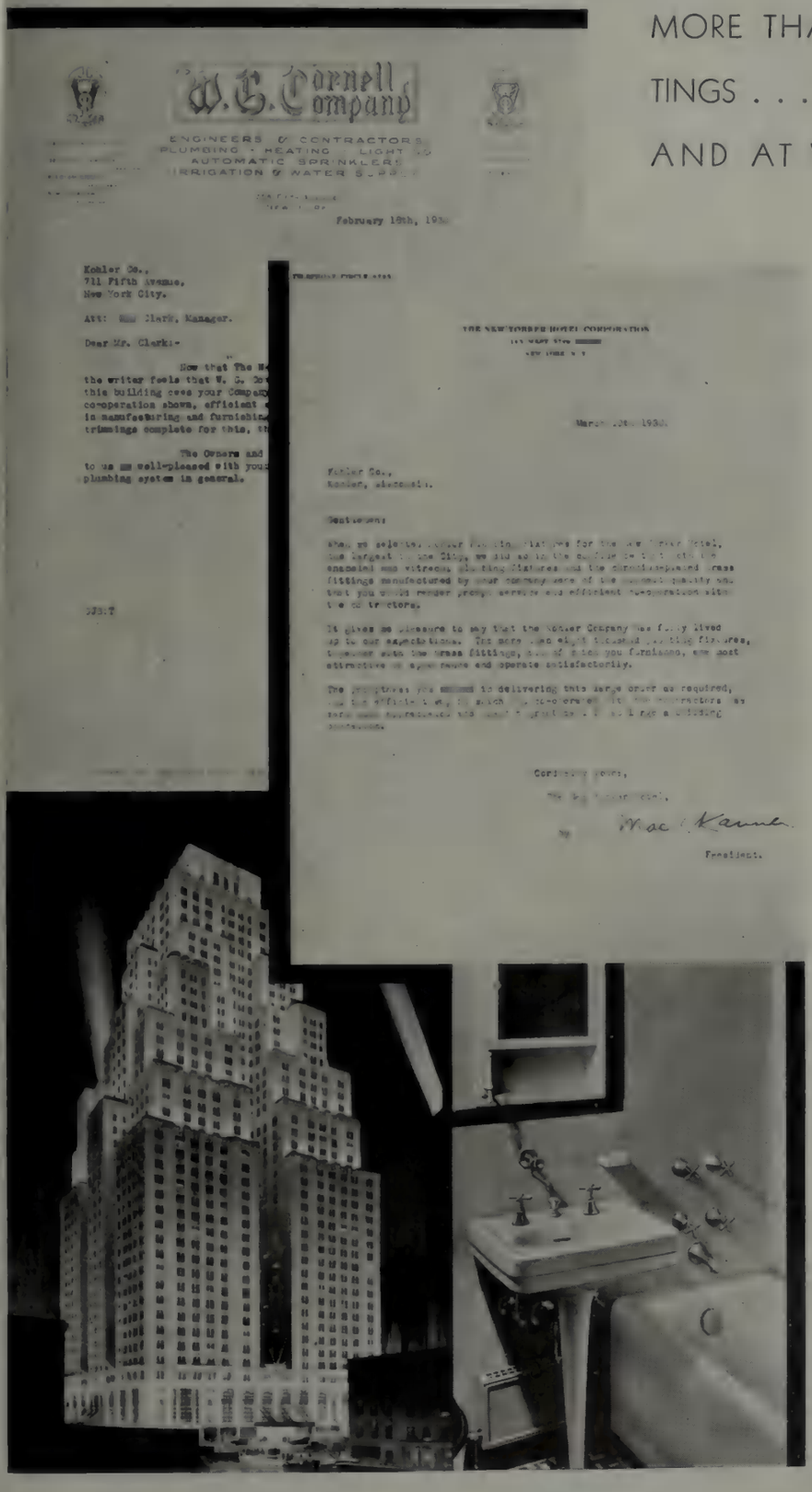
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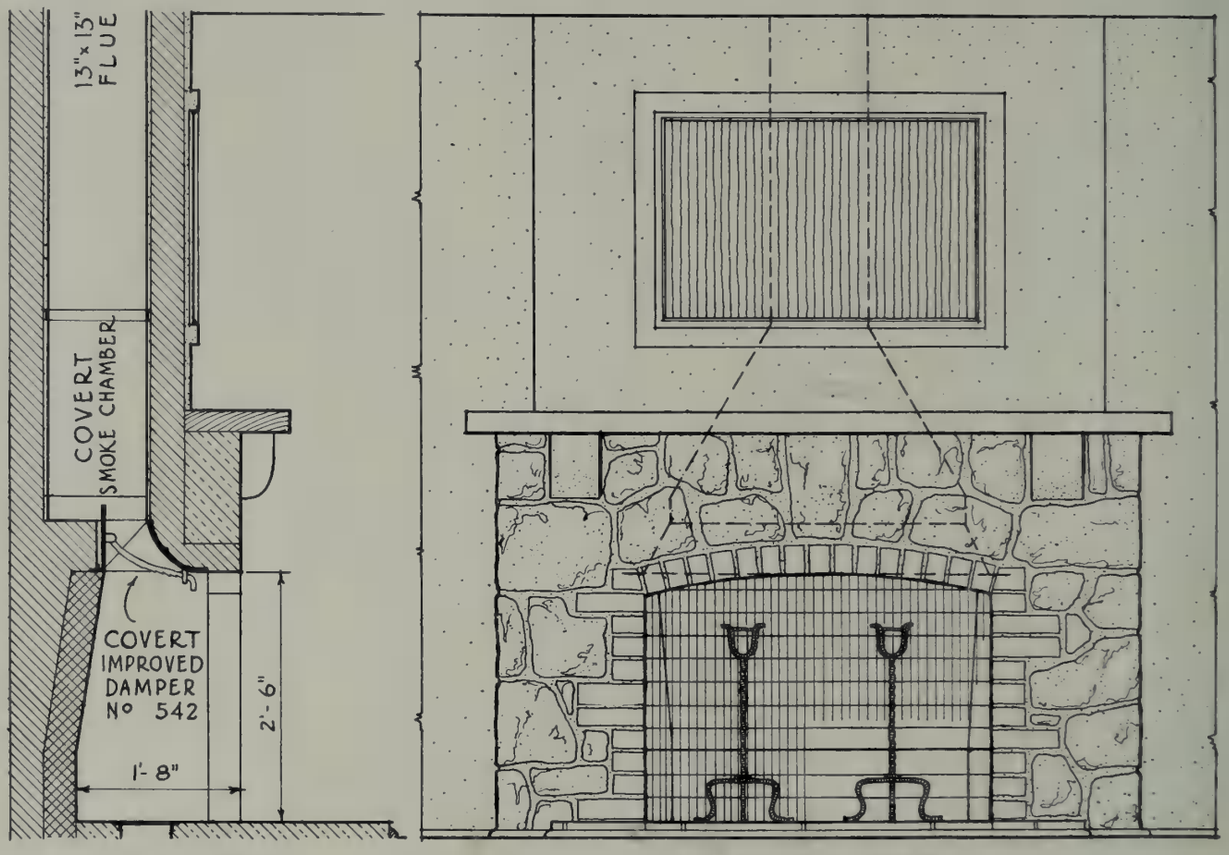
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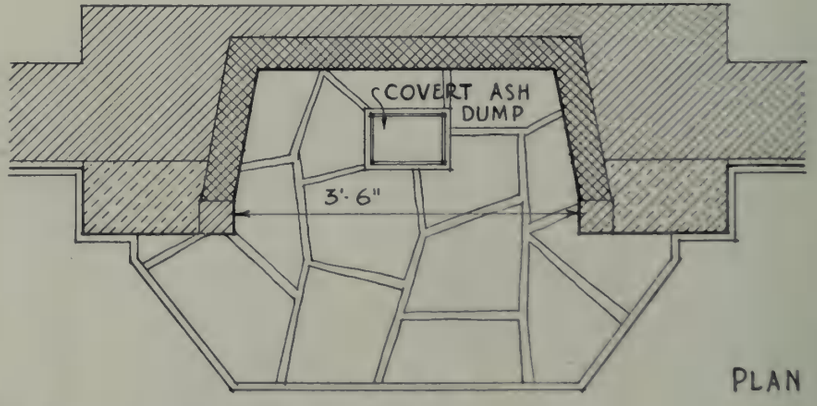
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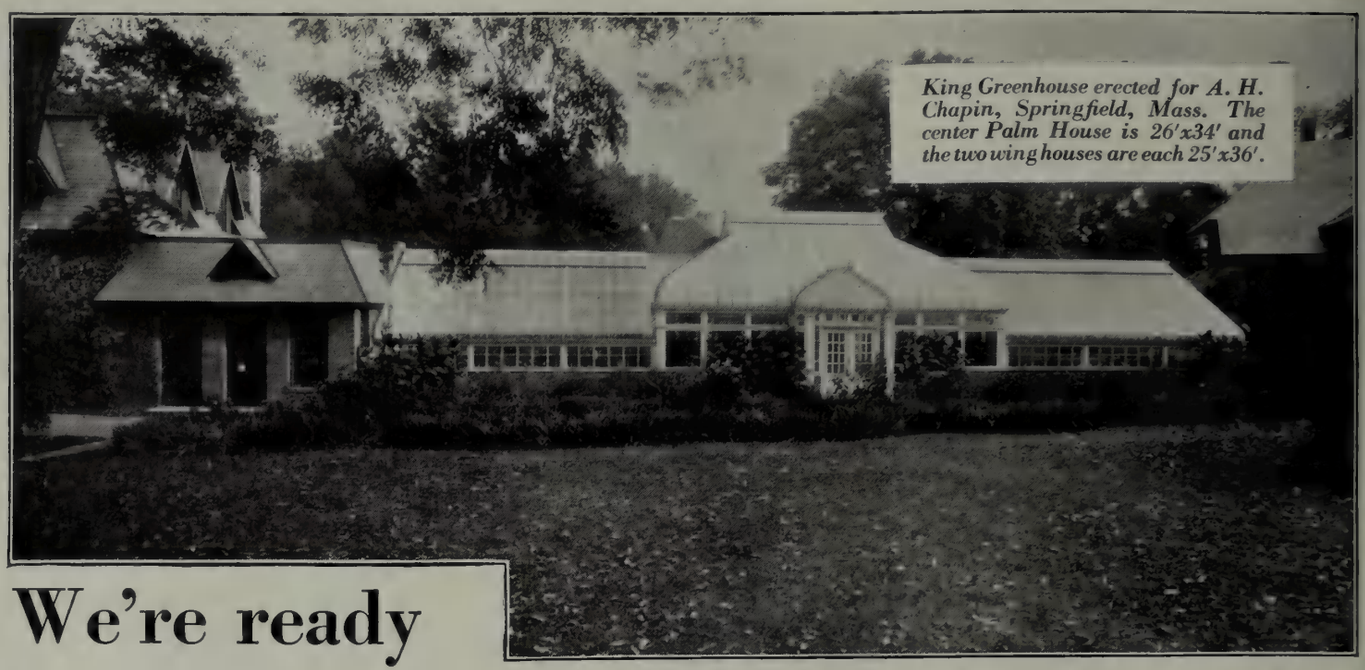
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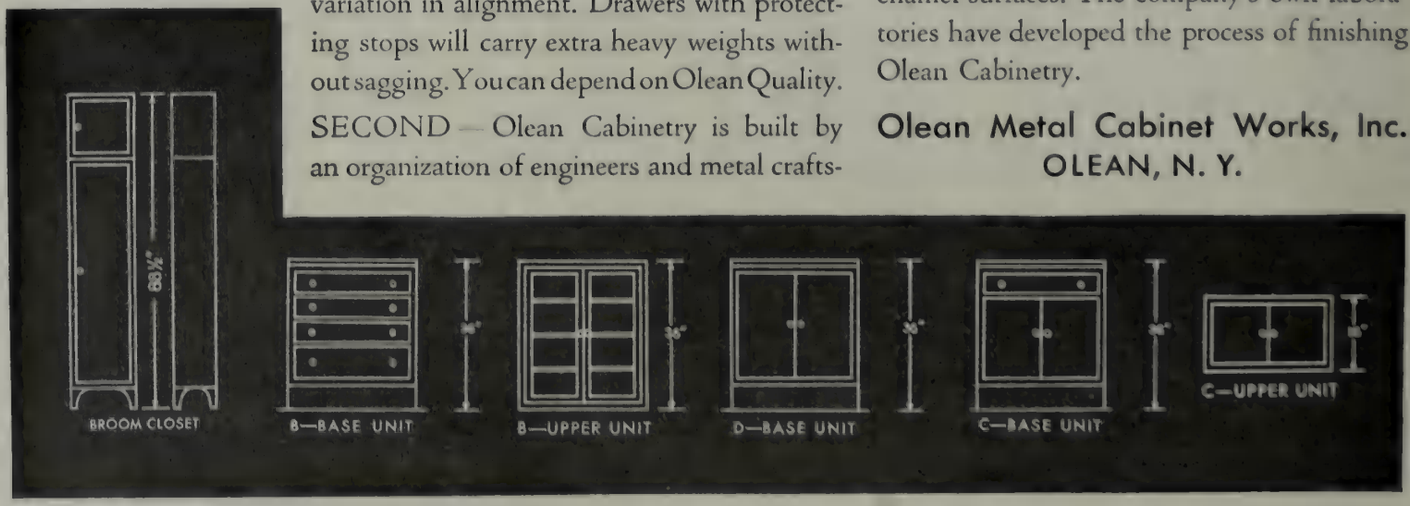
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A DIEBOLD VAULT DOOR complements the beauty of a well-designed building, just as furnishings change a house into a home. Each Diebold Vault Door, inside and out, is adaptable to the style of architecture of its building. This is made possible through the close co-operation of Diebold men with the architect. ★ ★ The above door meets the requirements for Class "E" Mercantile Burglary Insurance Classification. It is hung on a gooseneck crane hinge operating on Timken tapered roller bearings. It is seated in its jamb with a four-point pressure bar operated by a hand wheel with six hexagonal bakelite grips. The door is standard with one four-tumbler combination lock equipped with anti-dynamite device, for additional protection. A plate of 5-ply hardened chrome steel protects the locks and bolt throwing handle from burglar attack by drilling. Plates to this door afford protection against drills, torches and explosives. Ideal for jewelers or manufacturing concerns. See Sweet's Architectural Catalogues for details.

Diebold Safe and Lock Company

Canton, Ohio

SEVENTY YEARS OF BANK SERVICE



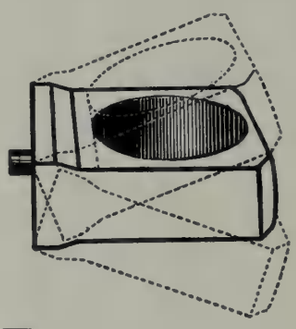


"THE DOOR CAN'T LOCK" ..they say



THE DOOR *MUST* LOCK

answers this NEW type of LOCK



THIS is the exclusive NORWALK Self-Adjustable Strike that engages bolt from any angle and locks the door regardless of shrinkage, warp or sag.

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Before and since Noah built his Ark, doors have shrunk and warped and sagged. Locks jammed, refused to lock, or took only a precarious, hair's-breadth hold. That day is past. With the entry of this new type NORWALK lock the door *must* lock . . . and lock with a burglar-proof grip . . . regardless of shrinkage, warp or sag.



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NORWALK

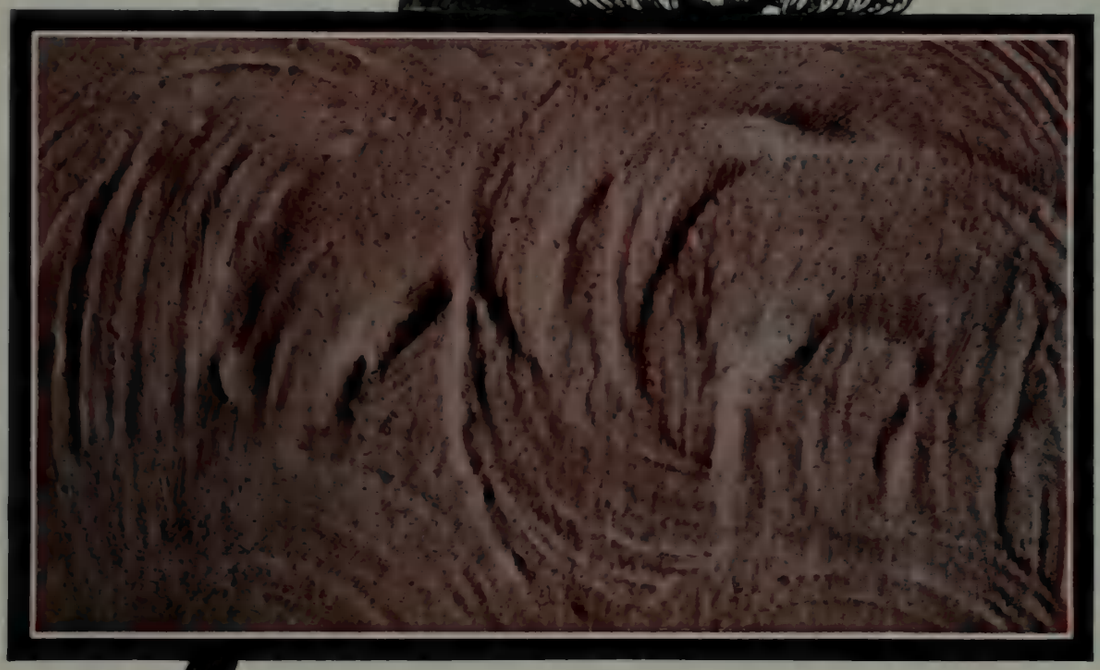
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Especially appropriate for hallways, stairways, and entrances. Results particularly distinctive can be secured in deep ivory or a combination of green and gold, slightly rust spotted. This effective texture is produced with a sponge swirl, brushed in.

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John Parkinson & Donald B. Parkinson, Los Angeles, Architects.

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WHERE BEAUTY DEFIES TIME

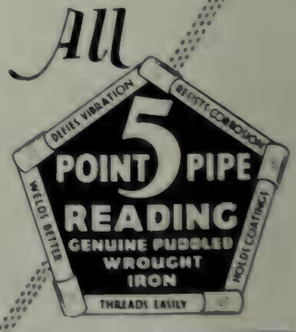
On Wilshire Boulevard, Los Angeles—artery for fashionable motor traffic—rises beautiful Bullock's Wilshire Department store, one of the most impressive buildings of its type. Modern in its soaring lines, Bullock's Wilshire smiles at Time—That Tough Old Tester. For deep within its walls is the pipe that keeps buildings new. Throughout the long years, the beauty of this structure will remain unmarred by costly pipe replacements and repairs. Wisely, Reading Genuine Puddled Wrought Iron Pipe was specified for plumbing and heating lines—the rust-resisting pipe that defies Time's onslaughts as does no other!

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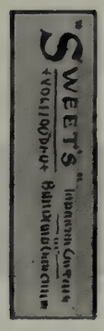
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AND TOMORROW



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Black Carrara stiles and partitions in lavatory of New York Central Building, New York City. Warren & Wetmore, Architects. James Stewart & Co., Contractors.

PHOTO BY VICTOR KEPPLER

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Modern Structural Glass

Typical of the Research Studies

appearing monthly in The RECORD is the article in this issue, entitled "The Problem of Making Brick Walls Watertight; also, Theatre Auditorium Planning, Lighting, Acoustics, and Construction."

FIRST PRIZE

in the A.B.P., Inc. awards for Editorial Excellence under the classification "Best Article, Series of Articles, or News Report," was recently conferred upon ROBERT L. DAVISON of The RECORD staff for the "Technical News and Research" series running throughout 1929. Study of the article appearing in this issue will illustrate the basis on which the jury made their award—architects appreciating the value of exhaustive research studies on specific types of construction, and manufacturers realizing that through this creative service a new avenue of contact with the members of the architectural profession has been opened to them.

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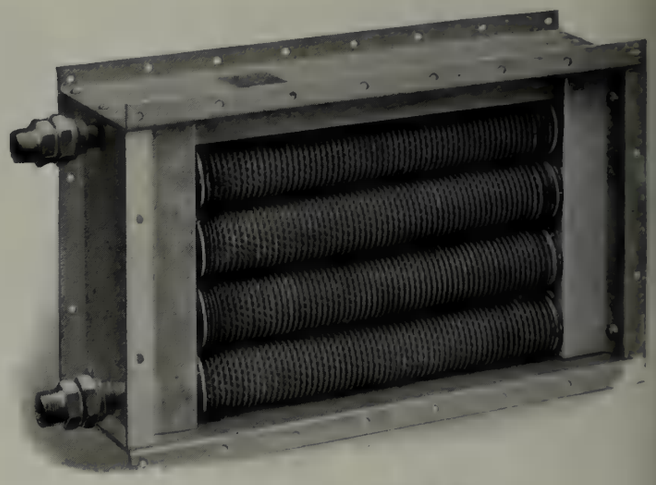


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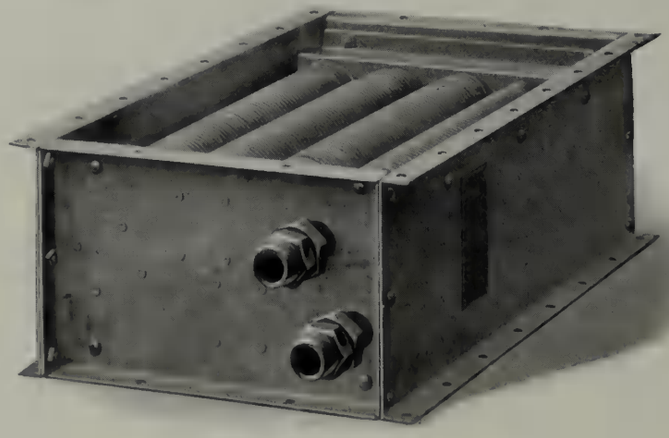


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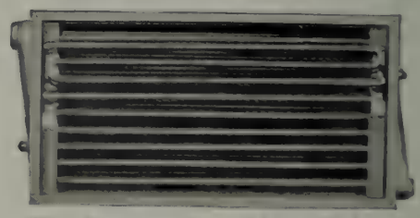
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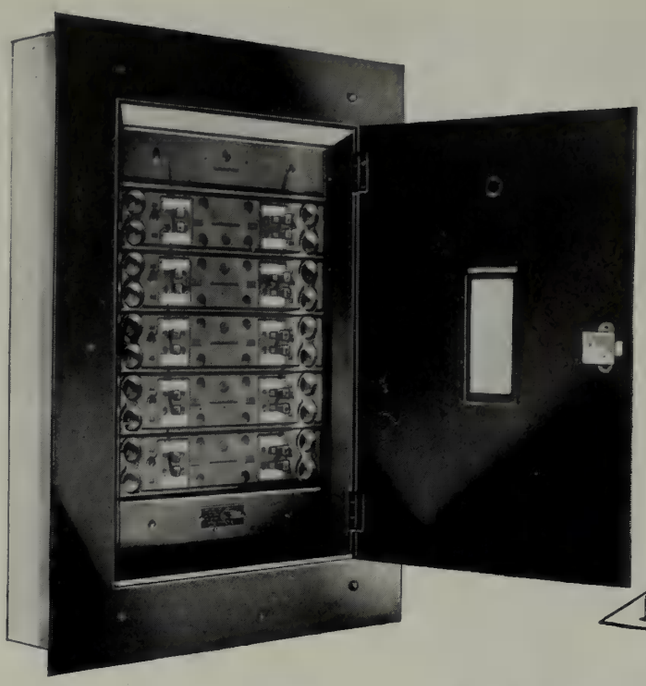
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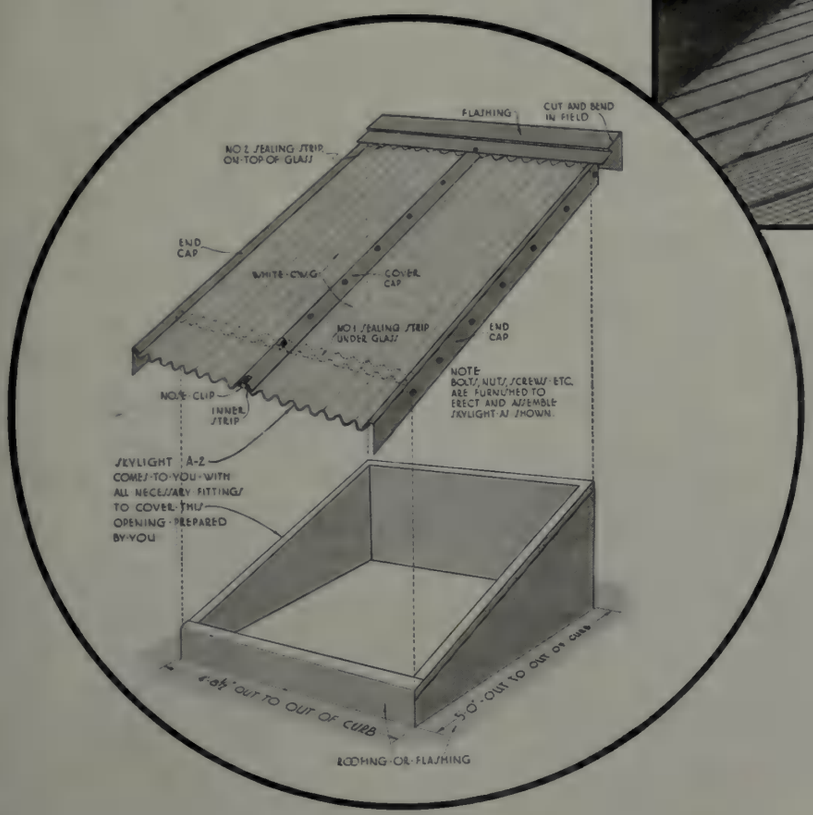
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As per your request of May 1st, we wish to express the pleasure and the comfort which we have had with the two Johnson Burners which you installed in our Amityville Building and Farmingdale Building.

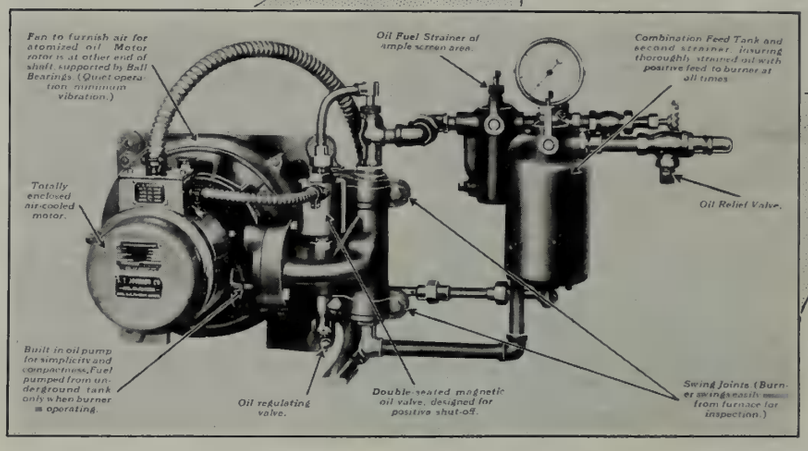
After a lengthy investigation we decided to install your burners, and up to today they have given us two years trouble-free service, and have saved us a lot of complaint from our tenants about heat, besides in actual saving on the fuel bill and the elimination of a Janitor, which in another year will pay for the investment.

We feel at this time that we wish to extend to you our appreciation for these splendid installations, and if at any time we can be of any sales help to you we trust that you will not hesitate to call on us.

Thanking you, we

Sincerely yours,

H. C. Troumbas



One of the thousands of unsolicited letters in our files, praising the dependability and efficiency of Johnson Oil Burning Equipment.

IN HUNDREDS of cases Johnson Oil Burners have paid for themselves by reducing fuel costs, eliminating janitor service and ash-removal expense. And these savings continue year after year.

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We will also be pleased to send a copy of our catalogue as published in "Sweet's," for your files. Just write *"Bulletin 4-B, please,"* on your letterhead or business card, no obligation incurred, your copy will be sent at once.

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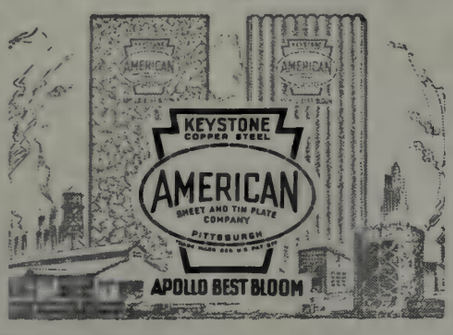
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The Story of Delano & Aldrich

DELANO & ALDRICH occupy a conspicuous position in the forefront of the architectural profession. Of international renown, buildings of many kinds designed by this firm are to be found from California to the battlefield of Waterloo.

The American Embassy building, about to be erected on the Place de la Concorde, in Paris, is being designed by this firm, as is the Embassy for the Imperial Japanese Government, at Washington. The American Pavilion at the International Art Exposition in Venice, a residence on the famous Belgian battleground and Dartington School, at Totnes, South Devonshire, England, are among the noteworthy foreign commissions executed by Delano & Aldrich.

Their work in this country includes the Walters Art Gallery, Baltimore, Williard Straight Hall at Cornell, Sterling Chemical Laboratory, the Sage Forestry School and several other buildings at Yale, Music School for Smith College, Northampton, Pocantico Hills residence of Mr. John D. Rockefeller, Sr., Port Washington residence of Mr. Vincent Astor, Cold Spring Harbor residence of Mr. Otto H. Kahn; bank and office building at Wall and Hanover Streets, apartment houses at 925 and 1040 Park Avenue and the Third Church of Christ, Scientist, all in New York City, the Herter residence in Santa Barbara, California, and the United States General Post Office Building, in Washington, the construction of which will start shortly.

Occupying some 15,000 square feet of floor space and employing about 70 persons, this firm does annually between eight and ten million dollars worth of work. The present year is the best in the history of the organization.

Both Mr. Delano and Mr. Aldrich are Fellows of the American Institute of Architects and Diplomés of the Ecole des Beaux Arts, in Paris.

William Adams Delano, a graduate of Yale, was an appointee of the late President Wilson at the Versailles Conference, he was also appointed by former President Coolidge, to the National Fine Arts Commission. He is a member of Secretary Mellon's Board of Architectural Consultants and of the National Capital Park and Planning Commission. He is also President of the New York Chapter of the American Institute and Chairman of the Institute Committee on Public Works.

Chester H. Aldrich, a graduate of Columbia, recently received a doctor's degree from that University. He was decorated by the Italian King following his services as Director General of Civilian Affairs, American Red Cross Commission to Italy. He has served on many juries of the Le-Brun Traveling Scholarship, the First Avenue Association, the Prix de Rome and the Beaux Arts Institute of Design.



Corner of Library in Delano and Aldrich offices. Many rare volumes on architecture are in this collection. Walls are paneled with fine old Italian oil paintings

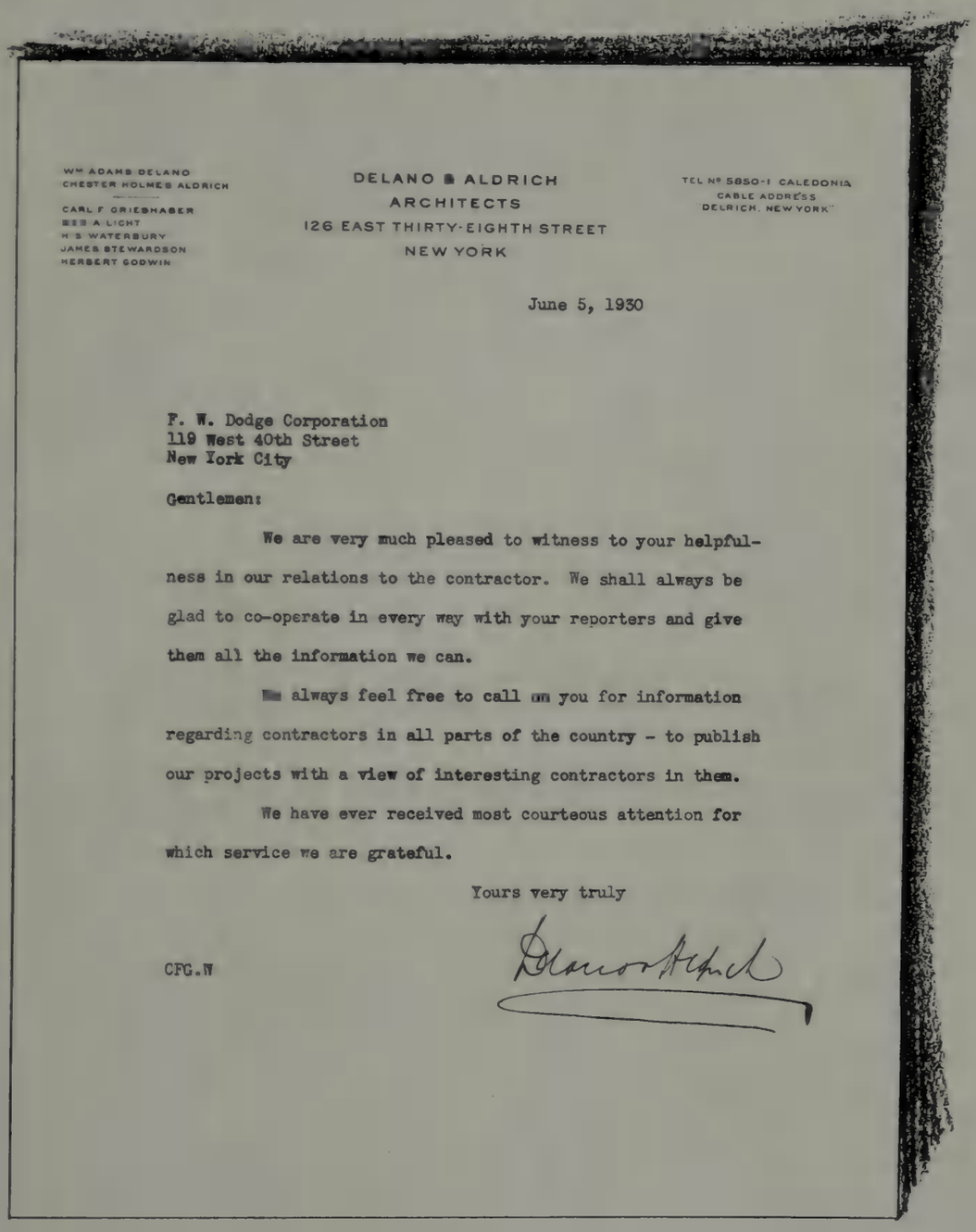


Delano & Aldrich offices are located in a building, in the Murray Hill district of New York City, that was once a stable



Entrance hall with reception [illegible] and library on the left; stair to executive offices at rear

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Yours very truly

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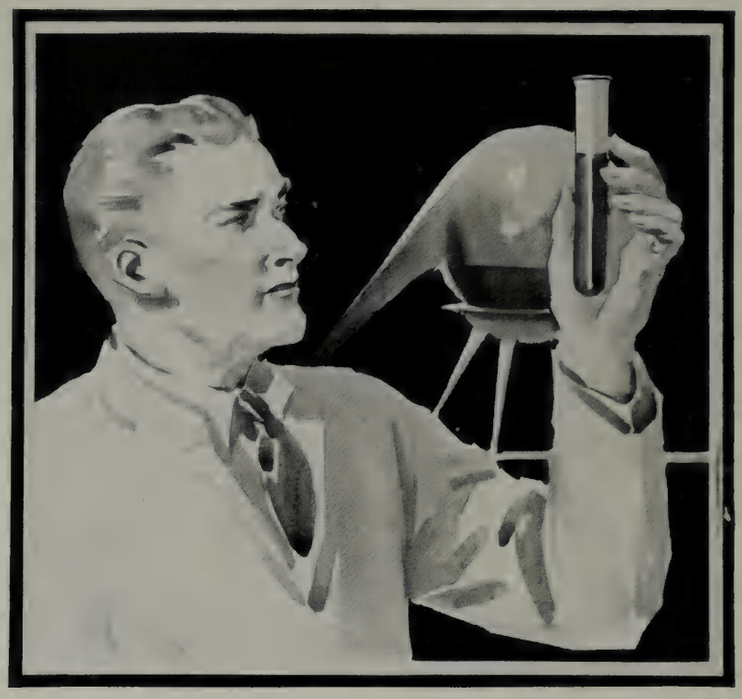
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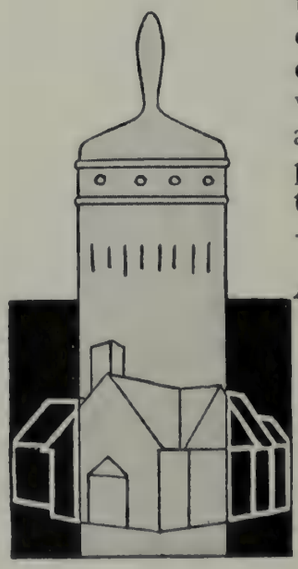
Priming with aluminum paint costs no more than "lead and oil" priming. Even when "back-priming" is added, the extra expense is trifling but the protection against moisture change in the wood is tremendous. Here are comparative figures on the house pictured above.

The original paint contract for this 10-room house called for inside and outside knot sealing with shellac, priming with lead and oil and two finish coats. The price was $1800. Before work started, the specifications were changed at the owner's request. Priming front and back of lumber with aluminum paint, made with Alcoa Albron Powder and a suitable vehicle replaced the lead and oil priming and knot spotting. The cost for this distinctly superior job was $1980—only $180 difference.

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Aluminum Company of America does not sell paint. But aluminum paint made with satisfactory vehicles and Alcoa Albron Powder can be purchased from most reputable paint manufacturers, jobbers and dealers. Be sure the pigment portion is Alcoa Albron and is so designated.

Let us send you the booklets, "Aluminum Paint, the Coat of Metal Protection" and "Specifications for Aluminum Paint". Address ALUMINUM COMPANY *of* AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA.



ALCOA ALBRON
POWDER FOR
ALUMINUM PAINT

GLEAMING
Monel Metal





The Montefiore Hospital, Pittsburgh, Pa., has Monel Metal food service equipment, installed by THE BERNARD J. GLOEKLER COMPANY, *Pittsburgh, Pa. Architect:* SCHMIDT, GARDEN & ERICKSON, *Chicago, Ill.*

View of Nurses' Cafeteria, Montefiore Hospital. The table top, work bench, sinks, cafeteria counter trim, railings, refrigerator trim, linings, are all Monel Metal, installed by The Bernard J. Gloekler Company, Pittsburgh. In the left hand corner may be seen a Monel Metal urn manufactured by THE LYONS SANITARY URN COMPANY, *New York.*

. . . the mark of the modern hospital kitchen

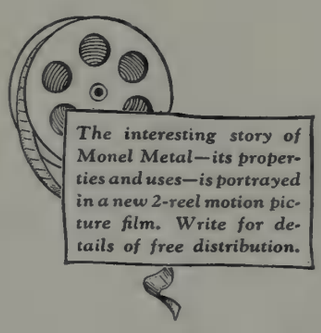
MODERN hospitals may differ widely in the design and construction of appointments and appurtenances, but there is one respect in which most progressive institutions are alike. These leaders almost invariably use food service equipment of Monel Metal.

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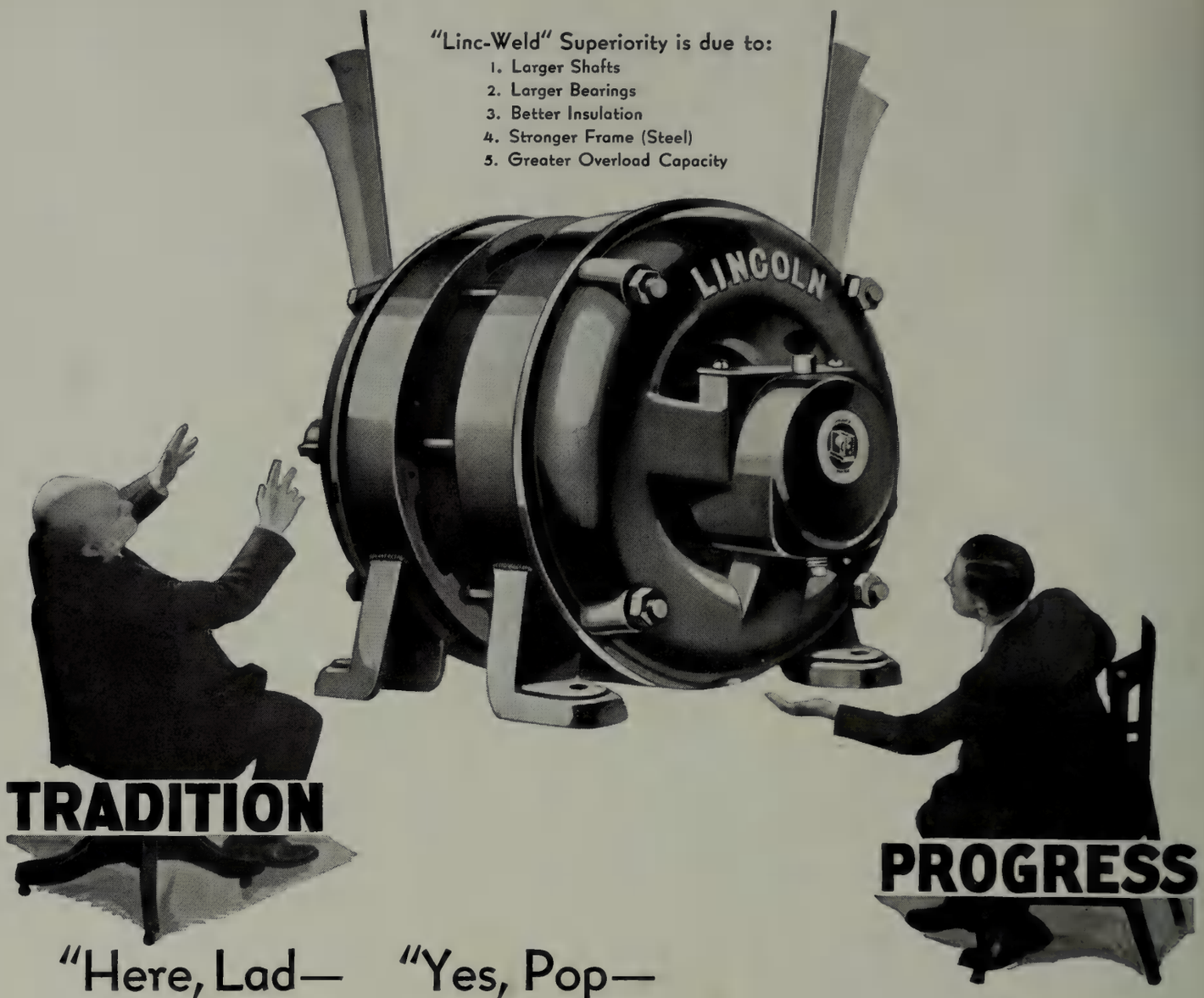
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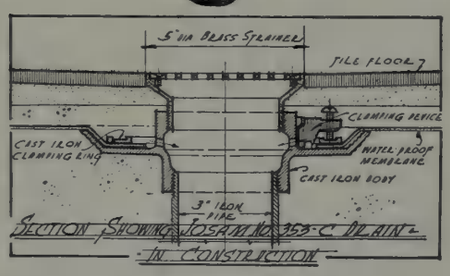
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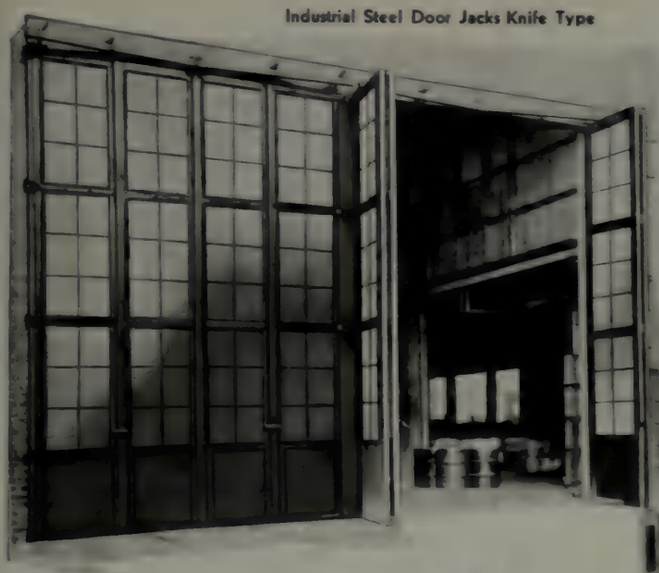


IN this magnificent terminal project—one of the outstanding construction programs of recent years—will be found many of America's foremost industrial products—acknowledged leaders in their line. Important among these products is the pipe—huge tonnages of which are required for the various tubular services throughout the buildings and accessories involved.

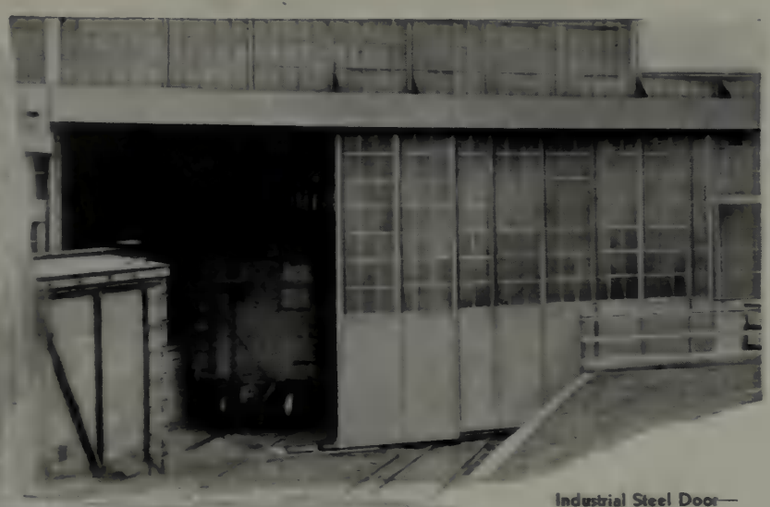
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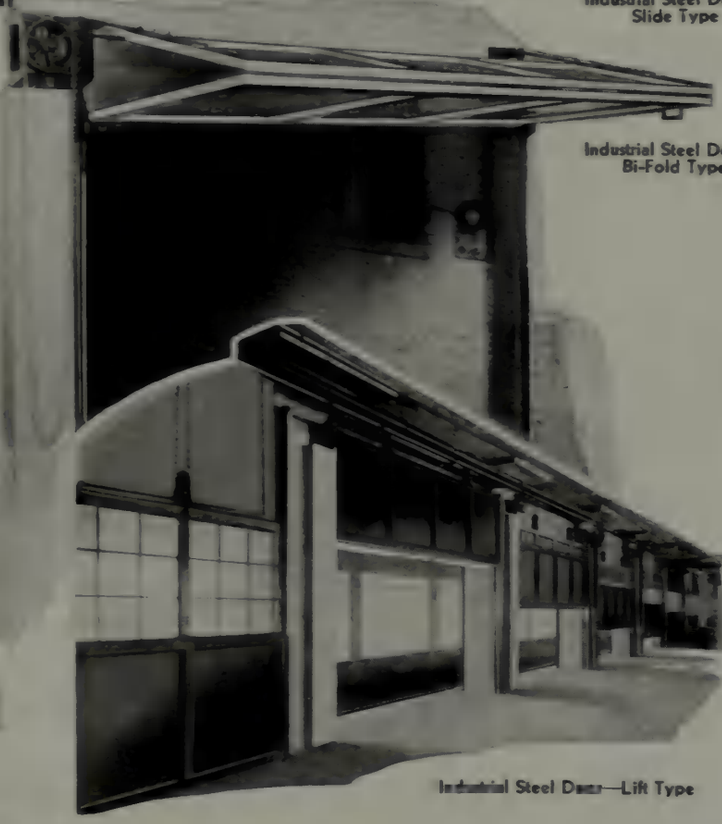
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The High Oven Range



The Junior Console Forty-Three

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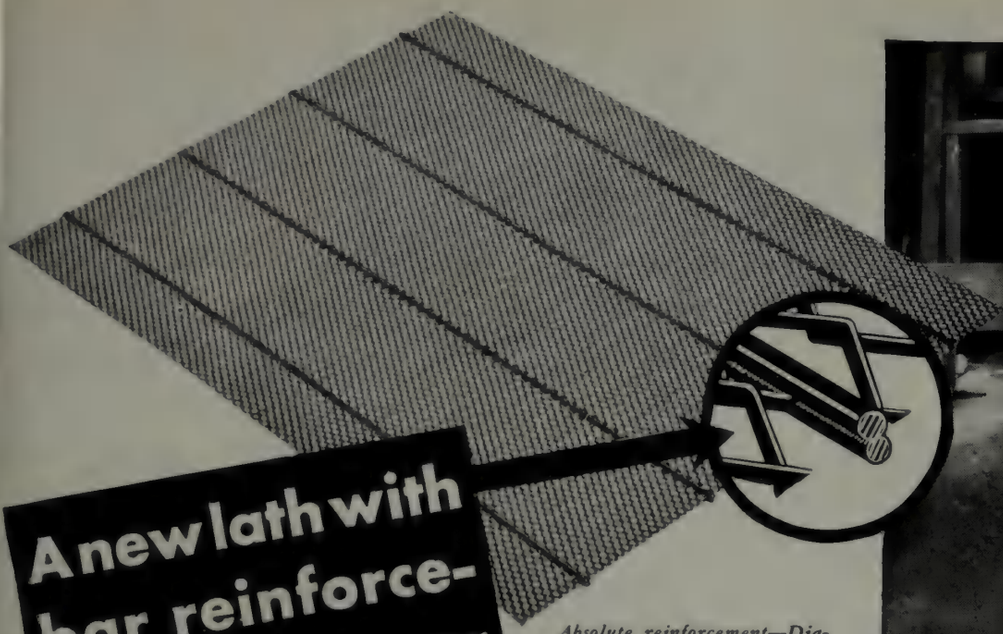
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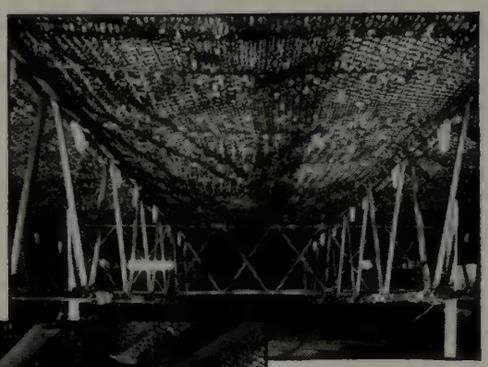
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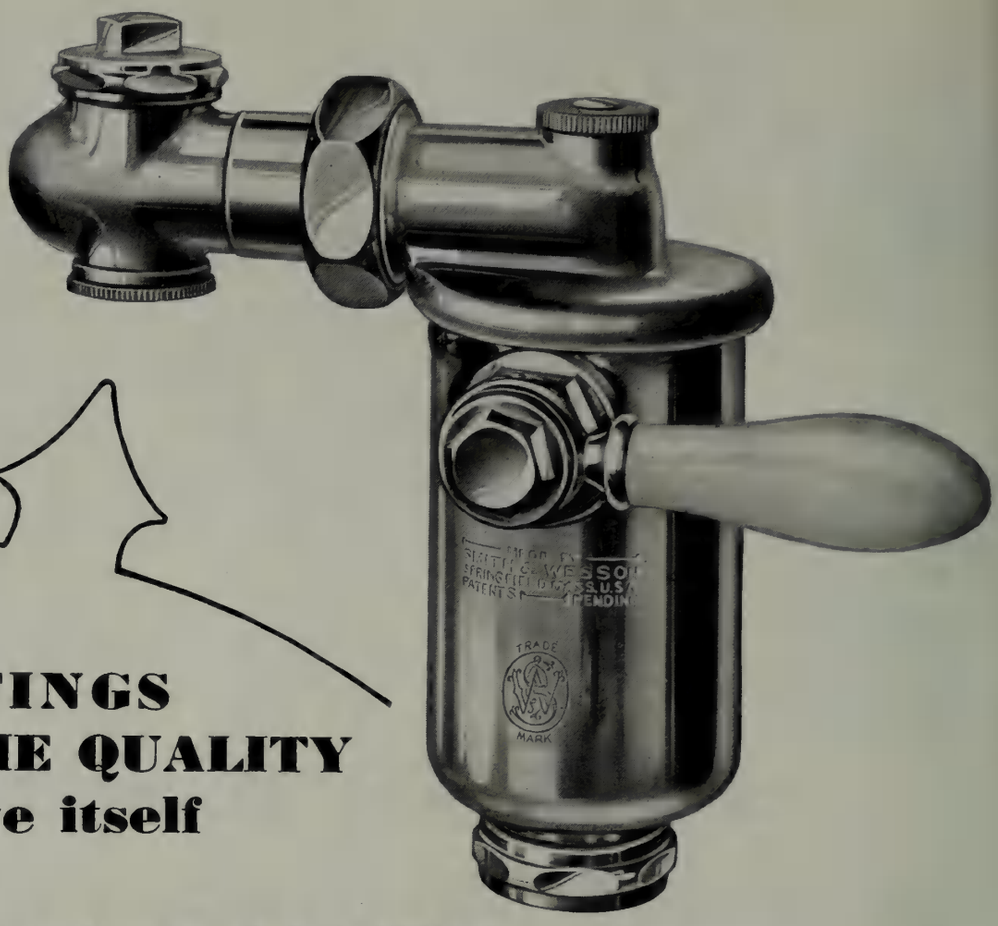
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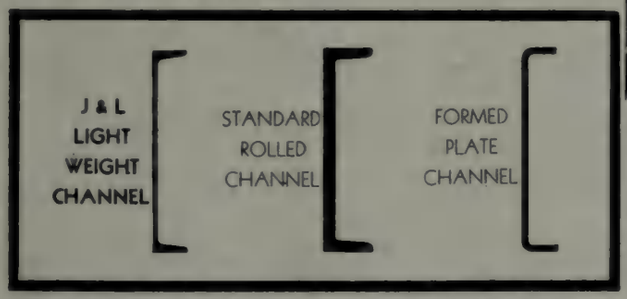
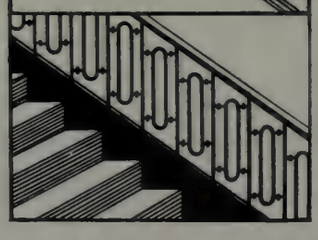


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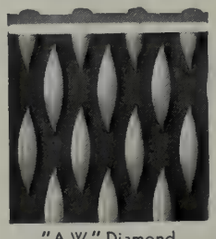
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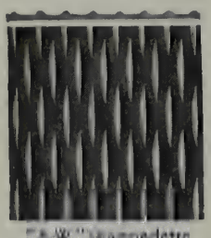


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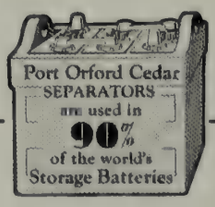
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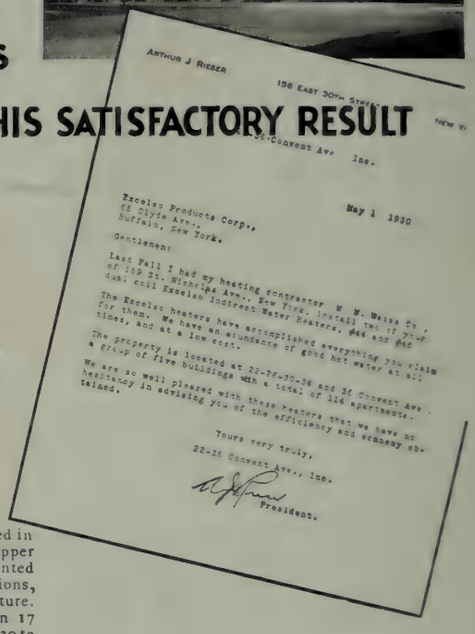
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—higher efficiency —lower installation costs —with RIC-WIL



After trench is graded, lay Ric-wiL Base Drain end to end like dominoes—the center bead serves as an alignment guide. Wedge PipeSupport saddles between every sixth section.



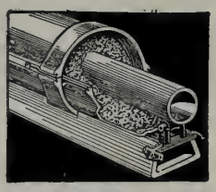
Set on bottom conduit section—every sixth section has a pipe support hole. Install and test the pipes—exceptionally easy, as pipes are in the open.



Pack Dry-paC Filler around pipes, put top conduit section in place, cement bells and Loc-liP Side Joints. Job is ready to backfill.

RIC-WIL CONDUIT, with RIC-WIL Base Drain, is quickly and economically installed. It eliminates a subtrench, hand-curving the bottom of trench and digging out for bells. It eliminates the necessity of reinforced concrete field construction and it can be installed rain or shine—thus avoiding delays. And you only handle three pieces to each two feet of conduit.

RIC-WIL Conduit, with its locked and sealed LOC-LIP Side Joint, provides a pipe housing that moisture cannot penetrate—it remains permanently dry. If it ever is necessary to repair a steam pipe removal of the top section of RIC-WIL Conduit gives complete access to the pipes. The pipe supports, saddled on the sturdy Base Drain, carry the entire pipe load.

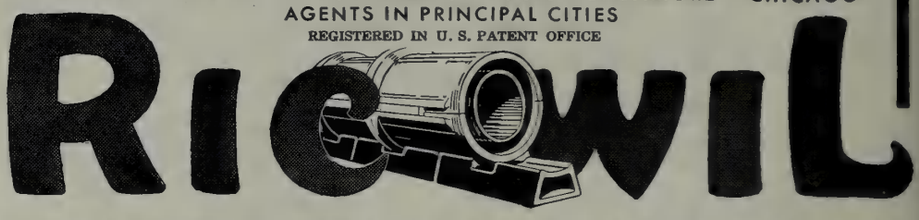


Sectional view Ric-wiL Type F, showing Loc-liP Side Joint, pipe support and Dry-paC packed around pipe.

Insulation may be any of four types, but Ric-wiL Dry-paC waterproof filler is by far the most effective. Dry-paC stays firmly around the pipes under all conditions. Repeated tests of Ric-wiL insulations using Dry-paC filler show from 92% to 94% efficiency—well over the guaranteed 90%.

Ric-wiL Engineering Service can help you. Feel free to write us for further information.

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1855 - SEVENTY-FIFTH ANNIVERSARY - 1930

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CRANE

CRANE CO. IS HAPPY TO THINK IT HAS HAD SOME LITTLE SHARE IN THIS ACHIEVEMENT . . . THAT AN IMPOSING NUMBER OF NEW BUILDINGS ARE EQUIPPED WITH ITS PLUMBING MATERIALS

Bowery Savings Bank
New York, N. Y.



FINANCIAL PROTECTION

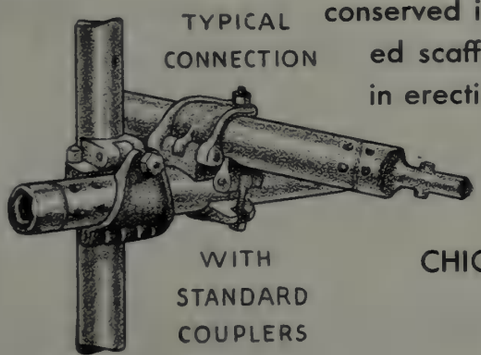
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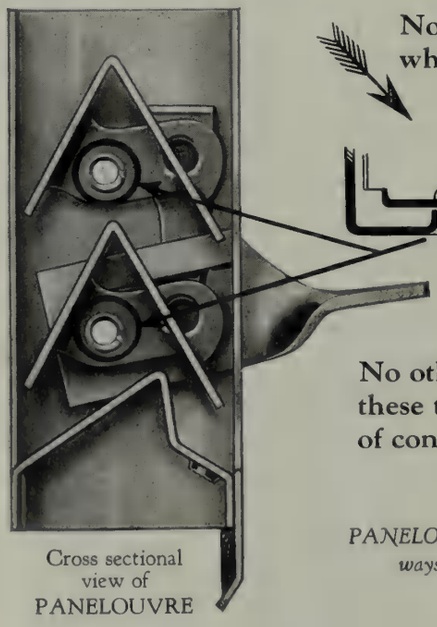
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Note steel bearings on which louvres operate.



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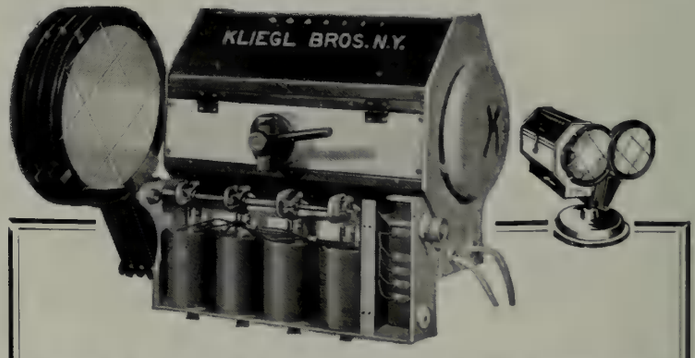
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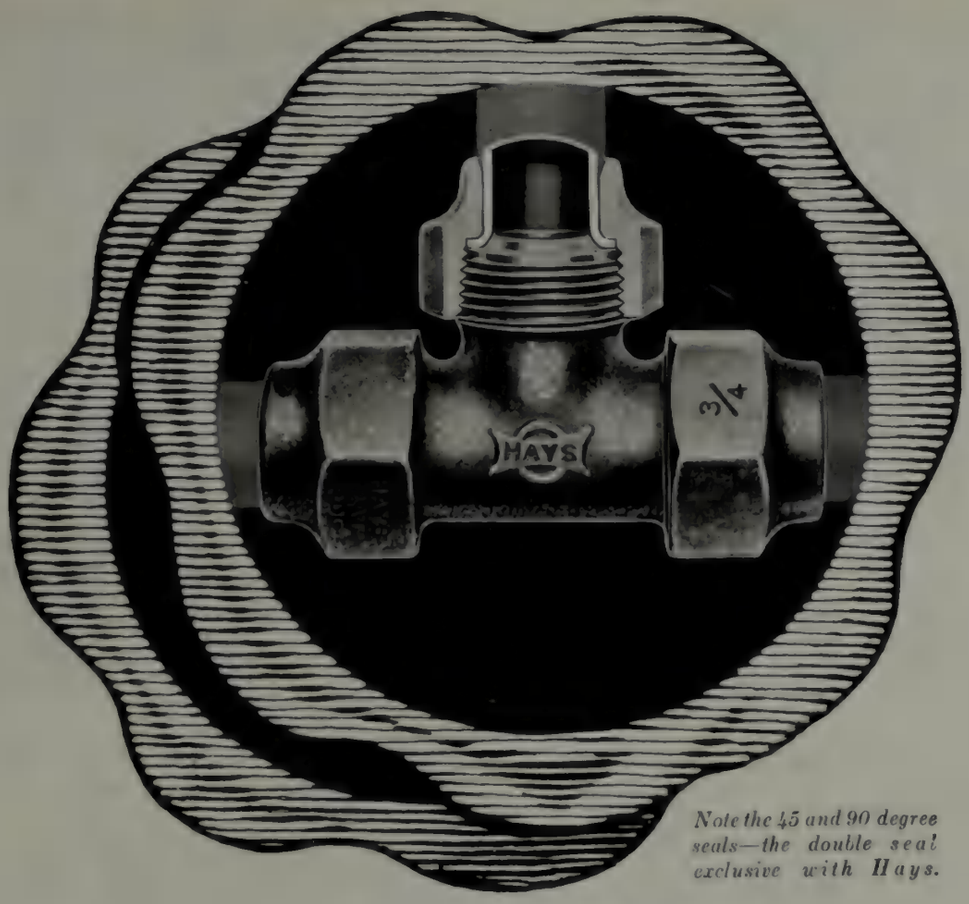
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Do you know that ORTHO-TONE speakers are built into the chandelier and can be had with ceiling fan, lights and speaker, all in one fixture?

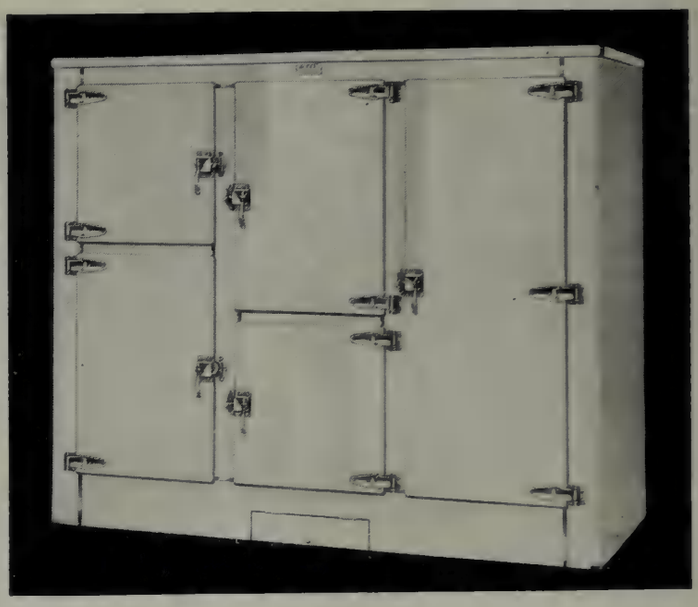
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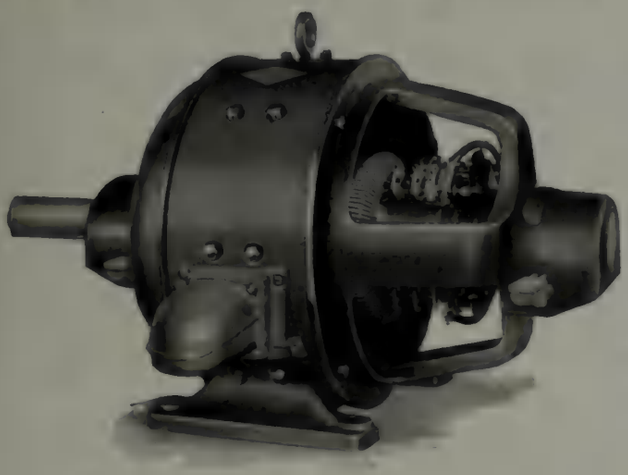
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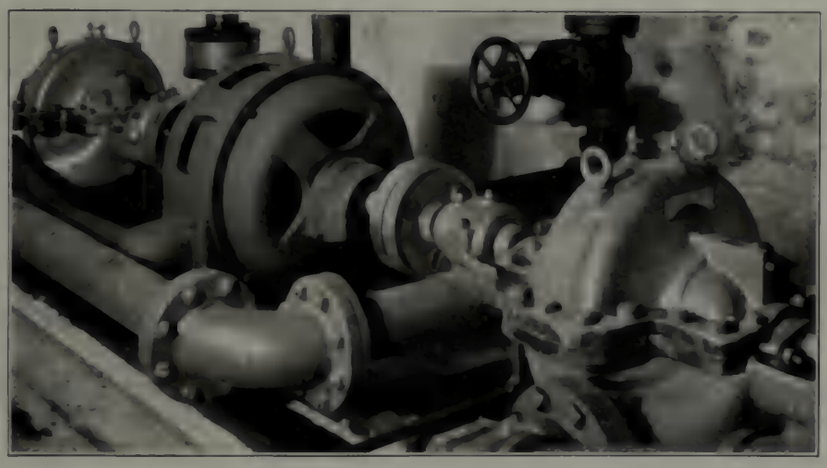
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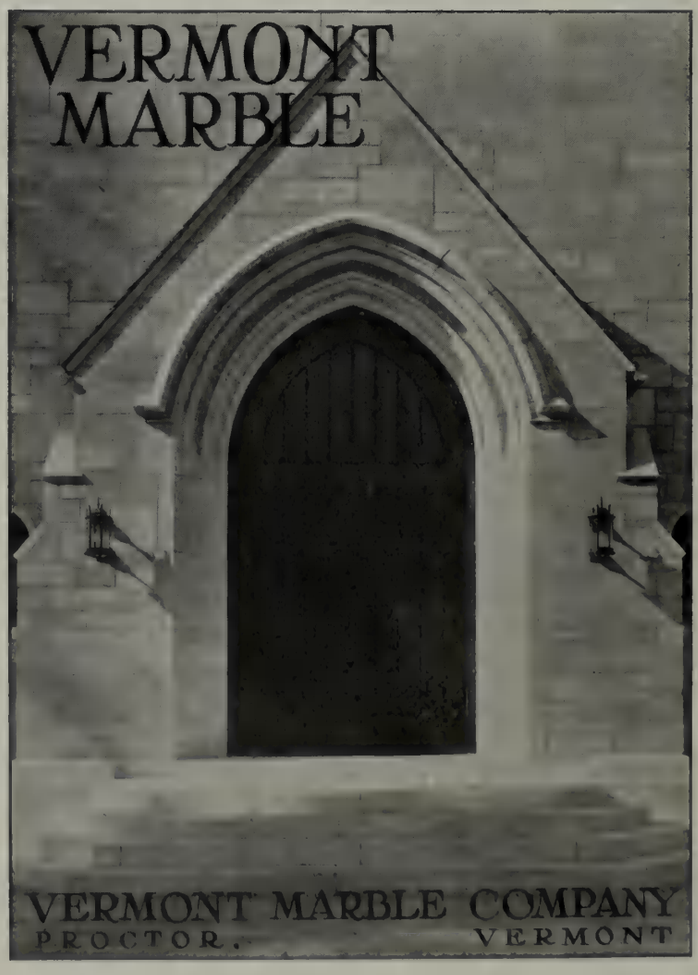
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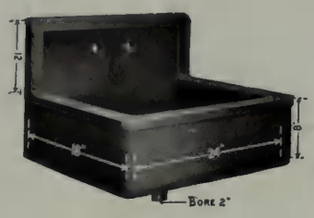


Figure 237
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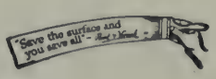
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It makes for convenience and economy to standardize on Dutch Boy White Lead in your painting.





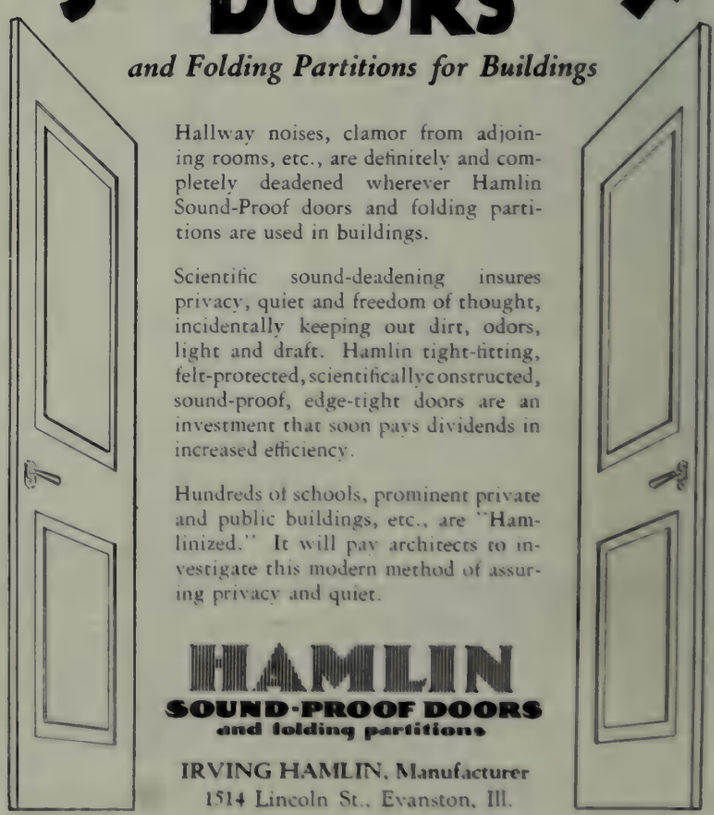
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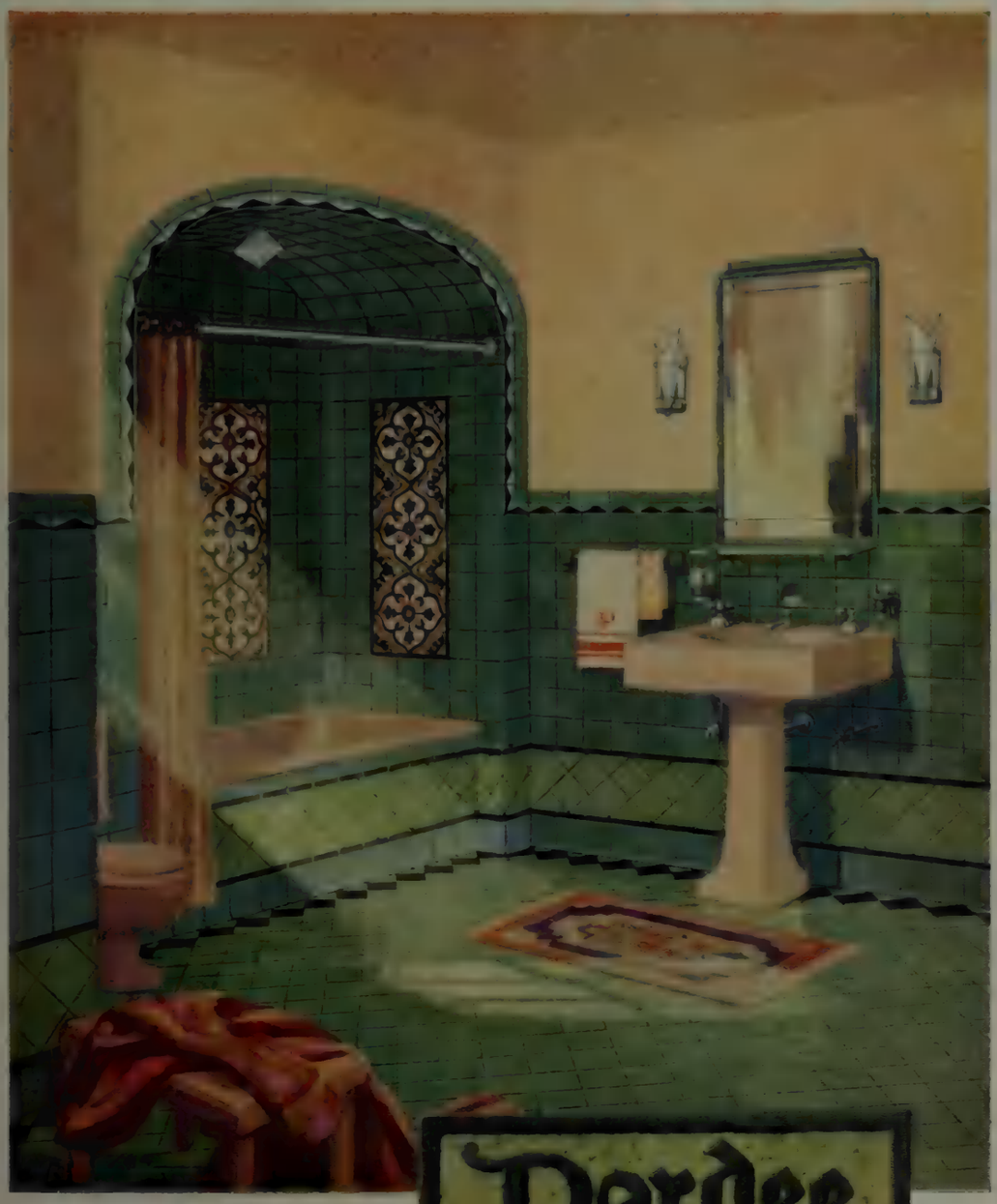
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BEATING a man down . . . getting "extras" thrown in all come within the category of what is commonly called a "good buyer." However, does the "good buyer" go out and take a look at the tile job he has BOUGHT after it is completed? We cannot bring ourselves to feel that he always does. We have seen too often the results of that extremely "low bid." We have a suspicion the "good buyer" would have a headache over some of the jobs he "bought right." Specify Pardee Tiles and then award your contract for this work to a reliable tile contractor. This is the best insurance you can obtain for satisfaction.



Pardee Supplies
Whatever You Need in Tile

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101 Park Avenue, New York City

Kindly send me without cost or obligation:

☐ Catalogue in color.

☐ Color sketch of enclosed area showing how it will look if tiled in Pardee.*

*I enclose (check one) ☐ sketch of tile area (withdimensions) ☐ blueprint with area indicated.

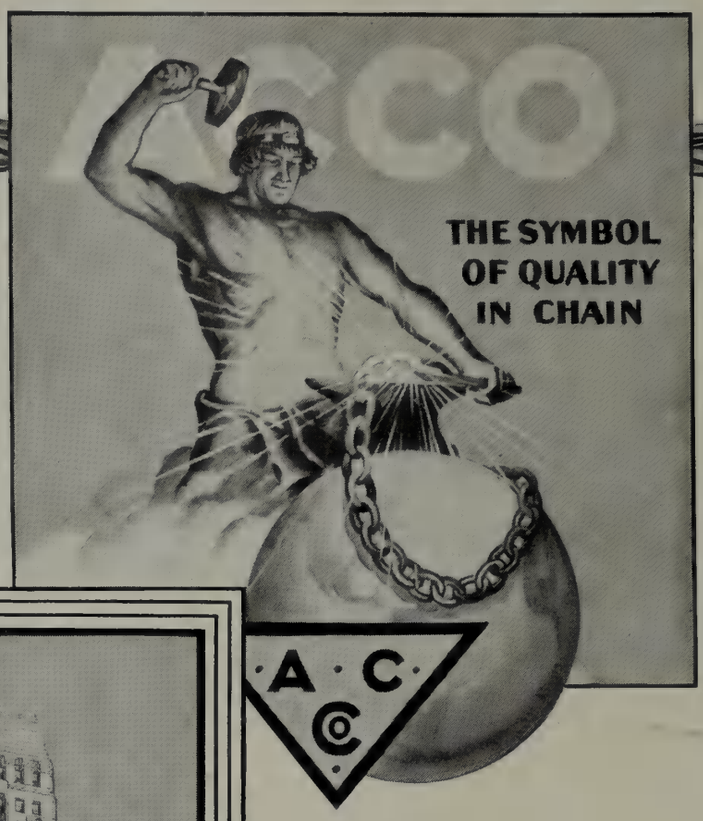
Color scheme is.....

Name.....

Street.....

City.....

State.....





FOREMAN NATIONAL BANK
Chicago, Illinois

Architects:
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Builders: *Paschen Brothers*

1586 Campbell Metal Windows

ONE of the newest structures in the financial district of Chicago is the Foreman National Bank Building. American Sash Chain was installed throughout—1586 windows.

American Sash Chain is *copper-bearing steel,* a material fully recognized by the American Society of Testing Materials. American Sash Chain also bears the approval of the Investigating Committee of Architects and Engineers.

Write for full particulars in handy booklet form for the writing of specifications.

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AMERICAN SASH CHAIN

AUTHENTIC PLASTER ORNAMENT



JOHN EBERSON, *Architect*

Reproduction of Spanish XVIth Century Ceiling

Among the best preserved of the old Spanish convents is the Convento de San Marcos at Leon built during the XVIth Century. It is justly famous for its ornamental ceilings of which this one, found in the main hall, is a notable example.

The extreme richness of detail is characteristic of the period and entirely in keeping with the Spanish furniture and wall hangings of this same era. The ceiling is pictured above as reproduced with startling effect by Jacobson in the New York offices of Mr. John Eberson.

The new Jacobson catalogue, comprising 3109 new designs never before published, is now ready for distribution to recognized architects and decorators. If you have not already done so, please write to make sure that your copy is forwarded promptly. A catalogue of Modern Ornament is in course of preparation.

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ARCHITECTS' ANNOUNCEMENTS

and Notes in Brief

CALENDAR OF EVENTS
GENERAL ANNOUNCEMENTS

May 20-Oct. 1	Exhibition of modern Architecture and Industrial Arts at Stockholm, Sweden.
July	The German *Werkbund* Exhibition at the Grand Palais in Paris. Exhibition of modern furniture, steel apartment house layouts, new construction, arranged by Prof. Walter Gropius of Berlin.
July-Oct.	International Hygienic Exhibition at Dresden, Germany. Buildings include a model hospital and a model housing project.
Aug. 4-9	International Exposition of American Import Trade, Grand Central Palace, New York.
Aug. 12-21	Study Tour of the International Housing Association in Denmark, Sweden and Norway.
Sept. 7-14	Twelfth International Congress of Architects, Budapest, Hungary.
Sept. 8-13	A course of lectures on *Fundamentals of Architecture* for members of Illuminating Engineering Society, conducted by the School of Architecture, Columbia University, N. Y.
Oct. 1	The Committee of Twenty on Street and Outdoor Cleanliness, 2 East 103rd Street, New York City, have extended their prize contest for the design of a Litter Basket for New York City till October 1. First Price $500.
October	The Department of Architecture of the University of New York will begin a series of lectures on "Promoting and Financing Building Projects."
Oct. 7-10	Annual convention of the Illuminating Engineering Society. Hotel John Marshall, Richmond, Va.
Oct. 8-12	Sixth National Conference of Church Architecture, Cleveland, Ohio.
Nov. 18-29	Art Exhibition, Royal Institute of British Architects, London (9, Conduit Street).
1930	Entries in the competition for the most beautiful bridge in North America are invited. Information can be had from F. H. Frankland, c/o Bridge Committee, American Institute of Steel Construction, Inc., 200 Madison Ave., New York City.

Louis Allen Abramson, Architects. Offices are now located at 25 West 45th Street, New York City.

William J. Stone announces the dissolution of the partnership of Brockway and Stone and the opening of new offices at 247 Security Building, Pasadena, California.

A. J. Daidone and S. L. Grant announce that they have formed a partnership for the practice of architecture under the firm name of Daidone & Grant, 189 Montague Street, Brooklyn, N. Y.

The architectural firm of F. Trevor Hogg and Walter E. Campbell, newly formed, wishes to receive manufacturers' samples and literature.

Bayard L. Barnwell, Architect, has opened an office at 1419 Esperson Building, Houston, Texas, and desires manufacturers' samples and catalogues.

Messrs. Weatherhead and Wall, Architects and Structural Engineers of Saint John, N. B. Canada, wish to announce that they have opened a branch office in the Higgins Building, Main Street, Moncton, N. B. Mr. E. Clain, Manager. Manufacturers' catalogues and samples are requested to complete files.

INTERNATIONAL CONGRESS OF ARCHITECTS

The twelfth International Congress of Architects will take place at Budapest between September 7-14. The conference will consider questions of international concern in architecture and an exhibition of work of all important countries will be shown.

LITTER BASKET COMPETITION

As a means of affording the public an opportunity to cooperate with the city in keeping the streets clean, the Committee of Twenty on Street and Outdoor Cleanliness, appointed by the New York Academy of Medicine, offers two prizes, one of $500 and a second of $250 for the best and second best design for a litter basket.

All applications and inquiries for further information should be addressed to the Committee of Twenty on Street and Outdoor Cleanliness, 2 East 103rd Street, New York City.

COMPETITION FOR A REMODELED HOUSE

A contest to find the best example of a house successfully remodeled is announced by Railroad Cooperative Building and Loan Association of 441 Lexington Avenue, New York City. Anyone who has recently remodeled a home is invited to compete in showing unique and ingenious ways in which houses are modernized. The following awards are to be made: $100 to the person submitting the best story and photographs of such modernization; $50 to the second best; $25 to the third best; and $5 to each of the next five.

Before and after photographs are desired to accompany the manuscript telling of the modernization process.

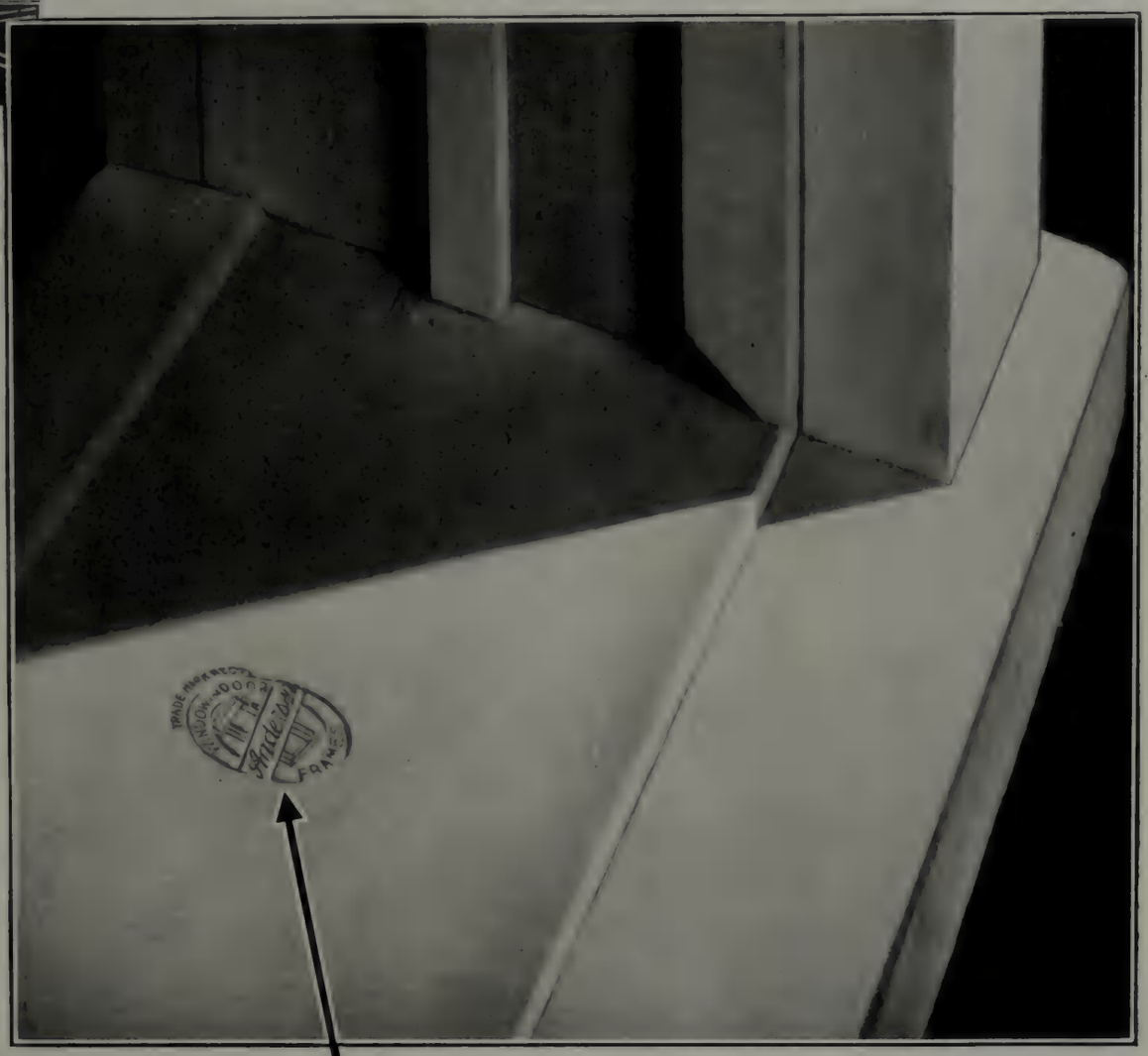
Contestants are requested to have all submissions in the office of the Editor of "Building-Loan," 441 Lexington Avenue, New York City by August 1, 1930. A committee of architects will serve as judges.

BRIDGE AWARDS

The American Institute of Steel Construction annual award for "the most beautiful long-span steel bridge built last year" was given to the McClintic-Marshall Company for the Mount Hope Bridge near Portsmouth, Rhode Island. A second award for the "most artistic" short-span bridge was awarded to the Mount Pleasant Bridge, constructed by the Bethlehem Steel Company



Architects welcome this new frame with locked sill-joint, which adds to the value of a home



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BAYPORT — MINNESOTA

FOR WEATHERTIGHT INSTALLATIONS — USE ANDERSEN SPECIFICATIONS

over the Harlem Division of the New York Central Railroad at Mount Pleasant, New York, for the Westchester County Park commission.

Admirable as is the intention of The American Institute of Steel Construction in making these aesthetic awards there is a wide open question as to whether a bridge should be built to be "most practical" or "most beautiful," or is not the bridge aesthetically satisfactory if it is good engineering?

IMPROVED HOUSE PLANNING

It is perhaps natural that, while the cost of building a house has increased, the average size of rooms has contracted. At the same time we have crowded many expensive utilities into our cramped quarters with the desire to expand our rooms without adding to the total cost of the house. H. L. Davis in the April *American Mercury* points out that the only way to expand contracted space, "except by practicing magic, is to make every available room perform more than one function. Instead of two small rooms, each of which remains idle 50% of the day, let us have one large room that works both day and night; and in order to take advantage of this combination, let every fixture in the room be as flexible as possible. There are limitations to this programme, for certain rooms must remain specialized; but we can go a long way without reaching them.

"To make a room perform more than one set of functions, one must consider both construction and decoration together. In England it is the practice to build houses for workmen and middle-class people without any built-in fittings; hence the bedroom discloses itself as such, no matter what the character of the bed, by reason of the fact that it will contain a wardrobe: similarly, the dining-room will contain a china closet. Once the character of a room is so established, there is no possibility of turning it to more than one function without obviously resorting to makeshift. The real solution of the problem has gradually been approached by the American architect; and by a curious chance, he has reached it in quarters where neither crowding nor economy were necessary. Instead of permitting a dresser, let us say, to bulk out in a dressing-room, he arranges a set of drawers in a closet: not merely does he get it out of the way, but he makes it more dustproof than before. This principle is capable of being pushed much further. With the aid of sliding doors, a whole wall may be turned into a closet, neatly embracing a chest of drawers, a dressing-table, and a clothes-rack; or, on a well-hung door, a dressing-table and stool may be brought out temporarily into the room and restored to the wall when needed.

"By sacrificing thirty inches in the depth of a room, all the necessary utilities can be contained in a dust-proof closet, much easier to clean and keep in order than if they projected into the room. Our ingenuity has scarcely begun to work here. While our Puritan ancestors devised chairs that served as writing-desks and tables that became settles, almost the only contribution modern America has made is the bed that folds into a closet. In a highly cramped bedroom, this solution may occasionally be useful; but of all possible objects to stow away, a bed is the poorest candidate. For a well-constructed daybed is capable of performing twenty-four hour service; and to hide it in a closet two-thirds of the day is the height of uneconomic furnishing.

"By the expedient just described we have done something more than robbed the room of its specialized character and made it available as a general workroom or gathering place during the day—permitting the bedroom to be also a living-room or the living-room to be a dining-room: we have increased the amount of apparent space. The effect of spaciousness in a room is created by decreasing the number of objects in it and reducing their size. In this department, too, hygiene and utility have the backing of aesthetics. One of the anomalies of present-day manufacture is that our furniture makers continue to be sublimely unaware that the actual living space of a modern urban family is highly embarrassed by their ostentatious products. The scale and general design of furniture must take into account this fact: a certain lightness and delicacy must be achieved, without of course sacrificing comfort or durability. At a recent exhibition, Kem Weber showed some dining-room chairs which had this quality; and one wishes it were achieved more often."

"CHOOSING AN ARCHITECT"

Architects for school projects cannot safely be chosen on the basis of rendered sketches submitted by competing architects nor is it ethical that an architect "sell" himself to the board. A competition conducted under the guidance of The American Institute of Architects is an approach to a satisfactory management since the selection of jury, and rights of architects competing are amply protected. Competitions, however, are diminishing in form. There is a growing realization that a well qualified architect can only be obtained by investigation and a thorough consideration of the designers qualifications and experience. Some school boards have made themselves the seeking buyer, "refusing to let anyone sell it, and refusing to be sold." Services rather than the architect are demanded.

The New Jersey Chapter of the American Institute of Architects, through its special joint committee under direction of Mr. Harry T. Stephens has prepared a helpful document on "The Choosing of An Architect," in which methods of choosing an architect are described. The document will be of use to architects in educating school boards. Copies may be obtained by addressing Mr. Harry T. Stephens, 152 Market Street, Paterson, New Jersey.

No other belt has the *long life* or can offer all the advantages of the DAYTON COG-BELT

Certain definite, exclusive features of Dayton Cog-Belts are responsible for the outstanding success of Dayton Cog-Belt Drives. These features cannot be duplicated by any other V-Belt.

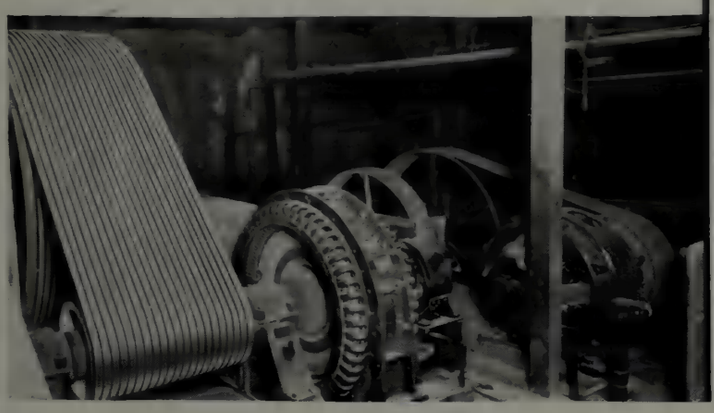
For example, no other V-Belt is laminated and die-cut in its finished state, for these are exclusive Dayton features. All others must be moulded.

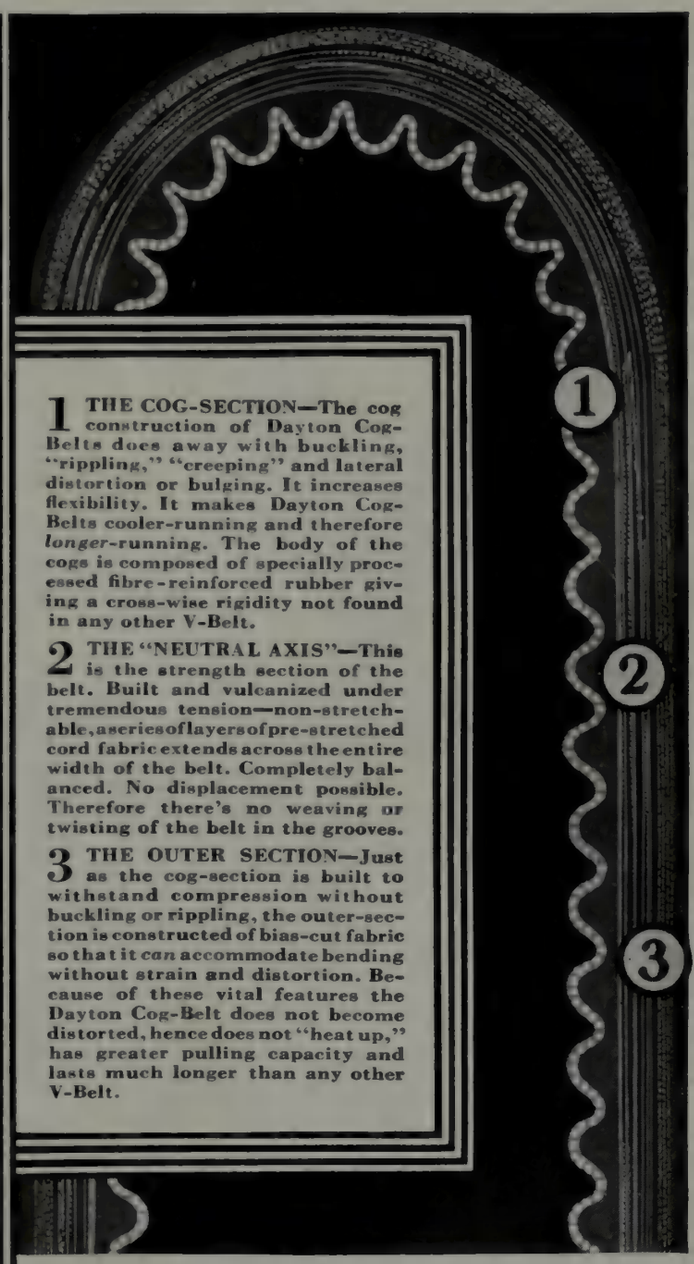
Dayton construction eliminates distortion. Daytons are—and remain—accurate—give truer alignment—have a firmer grip in the pulley grooves due to the die-cut raw edge contact-driving surface—there is no slippage.

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But let us give you complete information about these and the many other outstanding features that give Dayton Cog-Belts their amazing efficiency and long life. Send for a Dayton Cog-Belt Drive catalog and a sample section of the belt.

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1 THE COG-SECTION—The cog construction of Dayton Cog-Belts does away with buckling, "rippling," "creeping" and lateral distortion or bulging. It increases flexibility. It makes Dayton Cog-Belts cooler-running and therefore *longer*-running. The body of the cogs is composed of specially processed fibre-reinforced rubber giving a cross-wise rigidity not found in any other V-Belt.

2 THE "NEUTRAL AXIS"—This is the strength section of the belt. Built and vulcanized under tremendous tension—non-stretchable, a series of layers of pre-stretched cord fabric extends across the entire width of the belt. Completely balanced. No displacement possible. Therefore there's no weaving or twisting of the belt in the grooves.

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Dayton
COG-BELT DRIVES

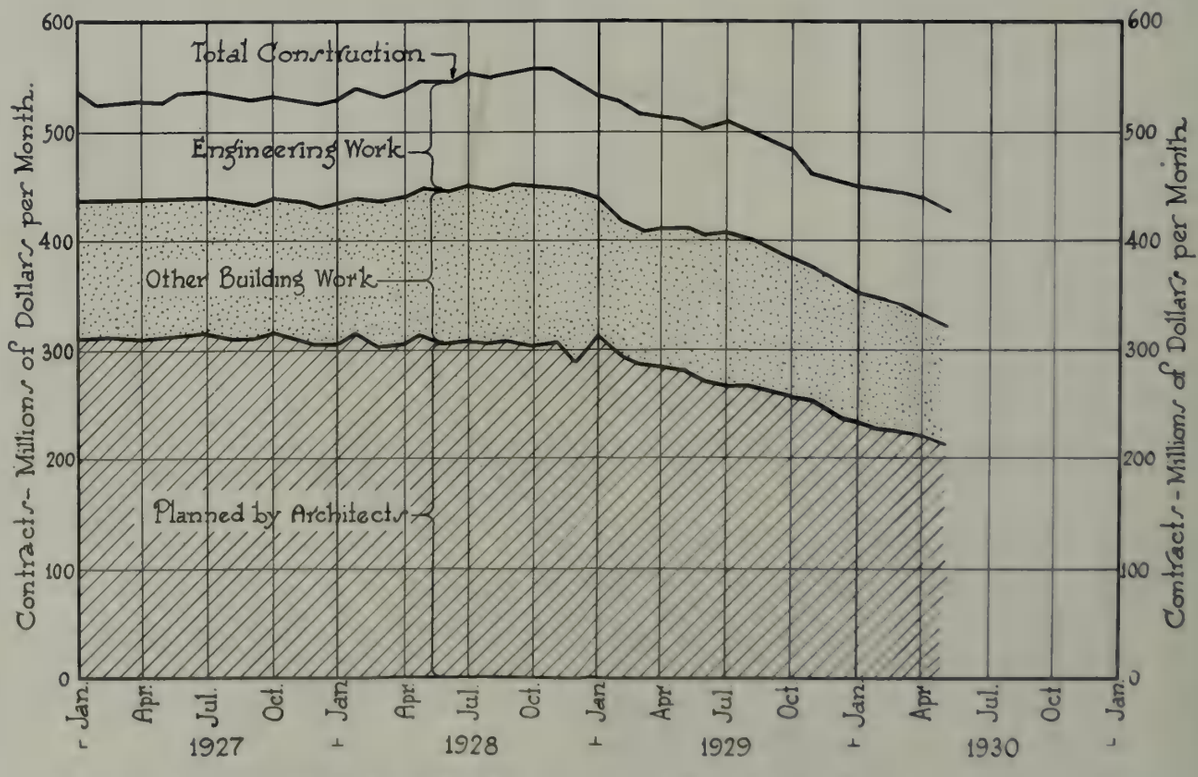
COMPLETE DRIVES—PULLEYS AND BELTS—
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CONSTRUCTION STATISTICS

From the records of F. W. DODGE CORPORATION, Statistical Division. The figures cover the 37 states east of the Rocky Mountains and represent about 91 per cent. of the country's construction volume. They include projects amounting to $5,000 and up.

First Five Months, 1930

	TOTAL CONTRACTS		WORK PLANNED BY ARCHITECTS		
	Number of Projects	Valuation	Number of Projects	Valuation	Per Cent. of Total
Commercial Buildings	10,327	$350,538,300	3,943	$278,895,000	51
Industrial Buildings	2,355	238,785,100	809	81,003,900	34
Educational Buildings	1,642	147,644,600	1,387	142,107,200	96
Hospitals & Institutions	464	75,548,900	363	69,050,700	91
Public Buildings	534	53,768,300	330	43,892,400	82
Religious & Memorial Buildings	818	44,416,400	566	41,425,500	93
Social & Recreational Projects	1,075	56,318,300	663	49,578,000	88
Apartments & Hotels	2,376	168,080,400	1,314	142,138,000	85
One & Two Family Houses	30,422	314,516,700	7,377	142,992,000	45
Total Building	50,013	1,449,617,000	16,752	991,082,700	68
Public Works & Utilities	7,572	587,822,900	117	20,228,900	3
Total Construction	57,585	$2,037,439,900	16,869	$1,011,311,600	50
Total Construction, 1st 5 months, 1929	75,253	$2,485,655,700	21,972	$1,275,463,300	51



General Trend of Building and Engineering Construction

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Rust, the eternal enemy of iron and steel, is ever alert for the attack whenever these metals are exposed to water, and protective coatings are at best only a partial defense. ¶ Positive protection against the danger of rust has been achieved in the Penberthy Automatic Electric Sump Pump and the Penberthy Automatic Cellar Drainer, by the complete elimination of iron and steel. These pumps are built of copper and bronze throughout — they cannot rust. ¶ Dependability and economy of operation are consistent with the quality of materials used in the Penberthy Automatic Cellar Drainer and the Penberthy Automatic Electric Sump Pump.

Both types are carried in stock by leading jobbers throughout the country

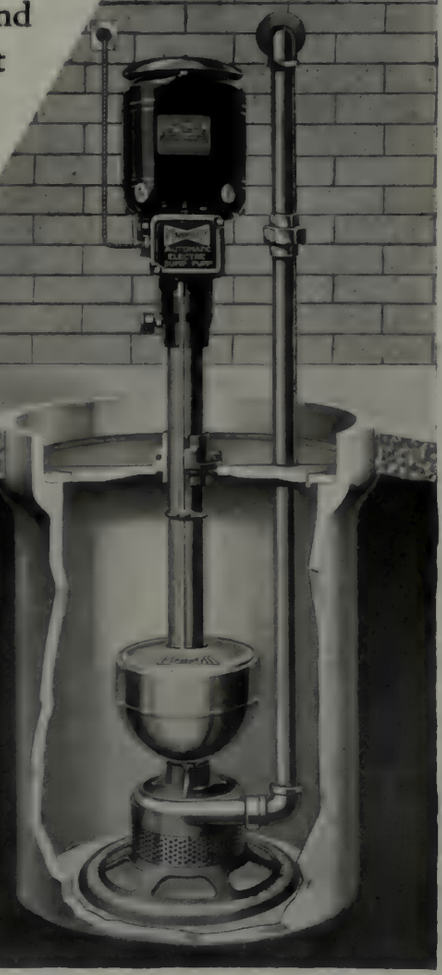
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PENBERTHY

Automatic Electric Sump Pump



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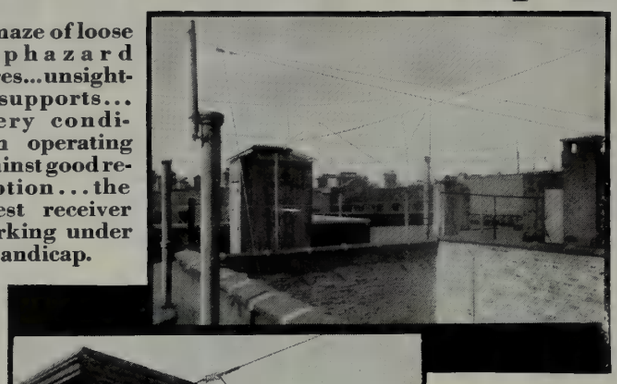
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A REVIEW OF CATALOGUES

HEATING GAS

Hand book on gas boilers. Floor plans, design and color scheme, also position of gas boiler in combination laundry and heater room, basement recreation and moving picture projecting room, basement play room, basement man's room. Section drawing of boiler and description of parts. Various models and their application. Tables: Ratings, dimensions, etc. Dimensional drawings. Gas boiler controls. 8½ x 11 in. 20 pp. Ill. Also, hand book on gas water boilers. Ratings and capacities. Tables to calculate boiler and storage tank capacities, to determine hot water consumption for various types of buildings. Chart on the cost of water heating. Automatic hot water storage systems. Principal dimensions and dimensional drawings. Construction details and specifications. 8½ x 11 in. 20 pp. Ill. Also, hand book on gas furnaces. Guaranteed ratings. Tables to determine size of warm air pipes for residence use. Dimensions and tables. Specifications. 8½ x 11 in. 12 pp. Ill. The Bryant Heater & Mfg. Co., 17825 St. Clair Ave., Cleveland, Ohio.

LIGHTING, CHURCH

Bulletin No. 1. Description, including particulars of manufacture, finish, glass, size and price of three types of lanterns. Beardslee Chandelier Manufacturing Co., 216–220 South Jefferson St., Chicago, Ill. 8½ x 11 in. 4 pp. Ill.

FLOORS, LINOLEUM

"New Ideas in Home Decoration," by Hazel Dell Brown. How to plan correct decoration for any room in the house. Special treatment and appropriate design of linoleum floor for studio, living room, dining room, sun room, play room, girl's room, boy's room, kitchen, etc. Color schemes and their application. Special floor effects of linotile and cork tile. Styles and finishes of linoleums and varied uses in the home. Linoleum rugs. Armstrong Cork Company, Floor Division, Lancaster, Pa. 8⅛ x 11 in. 40 pp. Ill.

WROUGHT IRON

Separate pieces of special design, including radiator covers, gates, fireplace fittings, etc., railings, grilles. Measurements and prices. Midwest Metal Art Division of the Newman Manufacturing Co., Cleneay Ave. and N. & W. R.R., Norwood Station, Cincinnati, Ohio. 9 x 12 in. 8 pp. French fold. Ill.

HEATING, GAS

Duplex unit control gas heating system. General description. Information on control, ventilation, enclosures, radiators. Detailed drawings. Indirect radiator system. Exhaust piping fittings and fan. Instructions for wiring. Directions for starting and adjusting a new installation and for operating units. Charts and tables. Roberts-Gordon Appliance Corp., Curtiss Bldg., Delaware Ave. at Tupper Street, Buffalo, N. Y. 9½ x 11¾ in. 20 pp. Ill.



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The **BALTIMORE TRUST Building**

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The services rendered by Robert W. Hunt Company on this building included mill and shop inspection and supervision of the erection of 7567 tons of structural steel supplied and installed by McClintic-Marshall Co.

See Sweet's A4

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HOSPITAL KITCHENS

"Practical Planning for Hospital Food Service." (Last of a series of five books on food service planning.) All phases of the planning of proper facilities for the preparation and serving of food in hospitals and institutions. Different types of service, practical kitchen layouts, diet kitchens, nurses' cafeterias, etc. Floor plans. Solutions of certain architectural and engineering problems involved in Hospital Food Service Planning. The John Van Range Co., 1200 West 35th St., Chicago, Ill. 8½ x 11 in. 62 pp. Ill.

TILE FLOORING

Full description of Bird tile flooring. Sizes; appearance; colors; varied tests—indentation, immersion, abrasion, flexure, flame. Actual samples. Bird & Son Sales Corporation, East Walpole, Mass. 8½ x 11 in. 8 pp. folder. Ill.

ASH CONVEYOR SYSTEM

Development of the Steamatic Pneumatic Ash Conveyor System. Operating advantages, including low steam consumption, low maintenance, dustless and noiseless features, remote control. Range of application. Sizes and capacities. Results of tests. Detailed drawings. United Conveyor Corporation, Old Colony Building, Chicago, Ill. 8½ x 11 in. 16 pp. Ill.

PANELBOARDS AND SWITCHBOARDS

Bulletin No. 49. The "Switchfuz" unit. Features of design including unit construction, external operation, combination switch and fuse. Operation and economical installation. Applications. Suggested specification for safety type "Switchfuz" switchboard. Frank Adam Electric Co., St. Louis, Mo. 7¾ x 10⅝ in. 8 pp. Ill.

HEATING SPECIALTIES

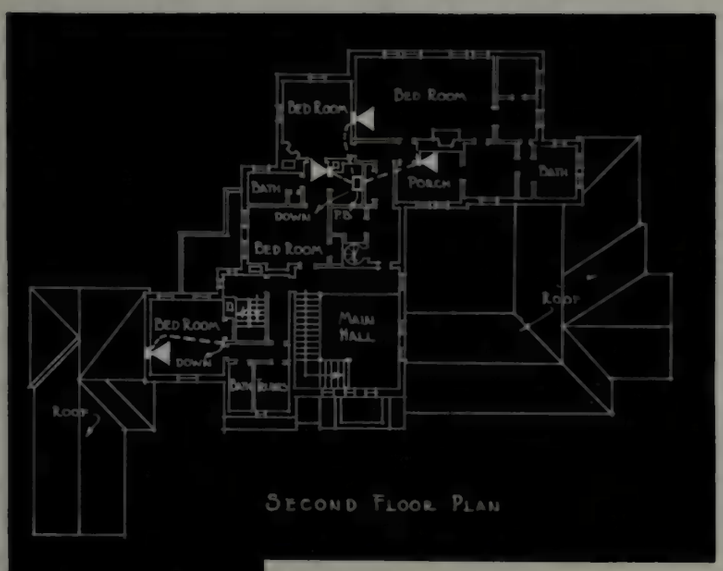
Data book containing detailed design and specification information relating to the Thermoflex line of traps, valves and related accessories. Description of manufacture with the Hydron process. Certificate of inspection tag attached to each unit. List prices, capacities and dimensions. 8½ x 11 in. 19 pp. (Loose leaf.) Ill.

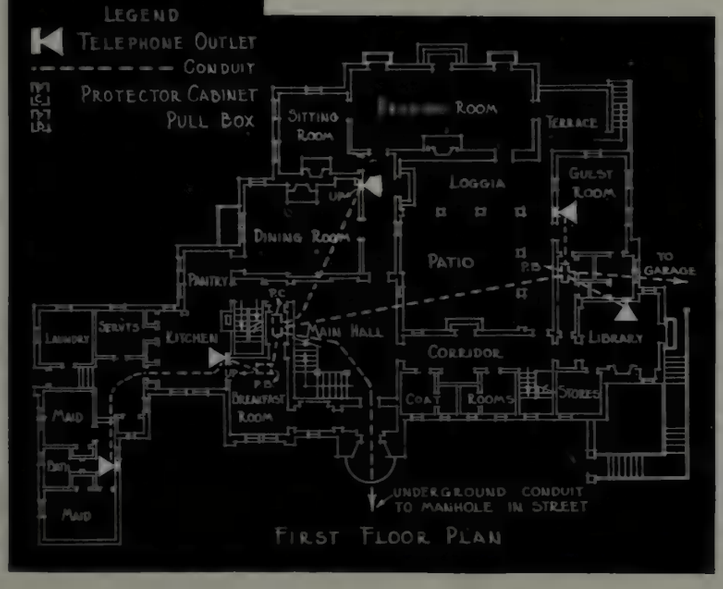
(Continued on page 188)

Telephone Convenience adds to the Individuality of a Residence



Complete telephone convenience is provided for in the residence of Mr. Francis Whitaker, 1155 Angelo Drive, Los Angeles, Cal., by ten telephone outlets, including one in the garage. Conduit within the walls and floors carries the wiring for the telephone system which will include inter-communicating features.
CARLETON M. WINSLOW, Architect, *Los Angeles.*





CERTAIN things contribute to the effectiveness of the well-designed home: its beauty . . . excellence of materials . . . other carefully chosen features which assure the comfort of those who live in it. The achievement of complete convenience, so essential to modern life, is increasingly claiming the attention of architects in every part of the country. And a considerable part of this attention is being directed to *telephone convenience.*

Many people who move into new homes, or who have their residences remodeled, desire to have telephones in all the important rooms. They realize how many steps and how much time this will save. And architects are meeting this modern need by planning for the telephone arrangements in advance of construction, and specifying conduit to all locations where telephone outlets may be desired. The home owner can then use just those outlets which best meet his requirements, and he can enjoy the improved appearance which comes from concealed wiring.

Representatives of the local Bell Company will gladly confer with you and your clients relative to appropriate locations for telephones. There is no charge. Just call the Business Office.

AMERICAN TELEPHONE & TELEGRAPH CO. AND ASSOCIATED COMPANIES
BELL SYSTEM

KANE QUALITY Venetian Blinds

for the Control of

Light • *and Perfect Ventilation*

SINCE "KaneQuality" 1890

By the Makers of "KANE QUALITY" Screens



"KANE QUALITY" Venetian Blinds offer the modern, ideal medium for the perfect control of Light and Ventilation in Offices, Hotels, Public Buildings and Residences.

To provide perfect diffusion of daylight, direct light rays to distant or nearby parts of the room, give flexible control of air currents with avoidance of direct drafts, assure privacy and add the distinction of good taste—these are functions of "KANE QUALITY" Venetian Blinds.

Made from Genuine Port Orford Cedar, the slats never check, split or warp and take a beautiful finish in any desired color.

Important improvements assure ease of operation and long service. Made in several types to meet every need. Write us regarding your requirements. See our catalog in SWEET'S.

KANE MANUFACTURING COMPANY

• KANE • PENNA.

A REVIEW OF CATALOGUES—Continued

LAUNDRIES

Reference data and information on laundries for hotels, hospitals, schools, clubs, office buildings, department stores, large residences. Floor drainage, lighting and ventilation. Small and big-capacity machines; other equipment. Floor plans. The American Laundry Machinery Company, Norwood Station, Cincinnati, Ohio. 9⅜ x 11¾ in. 20 pp. Blueprints. Ill.

INDIANA LIMESTONE

Indiana limestone for bridges and for public utility buildings. Why Indiana limestone is and should be used and where it has been used. Typical installations. Indiana Limestone Company, Bedford, Indiana. Two 4-page folders. 8½ x 11 in. Ill.

KITCHEN EQUIPMENT

Nappanee Kitchen Equipment Units as made by Coppes Bros. & Zook, Inc., are shown in color, outline and photograph in 8 pages. Full descriptions tell of the features of single and combination cabinets for general utility purposes in kitchen and pantry. Wood is chiefly used in construction, but steel and porcelain are shown for refrigerator, range, sink and miscellaneous accessory purposes, all of which are integral with the cabinet combinations. Containers for supplies, utensils and devices for systemizing work are shown and described. 8 pp. Coppes Bros. & Zook, Inc., Nappanee, Ind. (This catalogue is in Sweet's for 1930.)

CALDWELL SASH BALANCES

Backed by Forty Years' Experience



SIDE

Each Caldwell Sash Balance has a quality built into it that assures satisfaction, and maximum length of service.

Box Frames can be eliminated, thus contributing greatly to making a building of warm construction. They also permit the use of narrow mullions and double hung windows in rows to give the casement effect. Mortises can be cut at the mill to one size. When the saving of labor and material is considered, they cost no more than ordinary weights and cords.



TOP

Send for booklet "Present Day Architect" Giving Mortise Dimensions

CALDWELL MANUFACTURING COMPANY

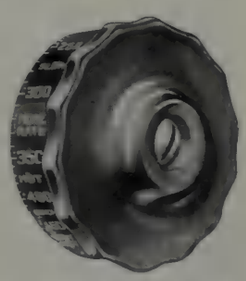
ROCHESTER, NEW YORK, U. S. A.



Something New . . . Reliable Gas Ranges now built to individual specifications for finest residential and apartment homes. ◙ ◙ These famous stoves have rigid framework of unbreakable Angliron, finished in durable, sparkling chromium that will not stain or tarnish. Hand-fitted construction by master craftsmen. Neither time nor service can injure the brilliant beauty of these magnificent gas ranges. ◙ ◙ Special designs of Reliable Custom-Built Gas Ranges will be created to meet any space- or service-requirements. Blueprints submitted for approval. Many installations now giving exceptional satisfaction. Correspondence invited from those who seek individuality, permanent beauty and a complete and faultless cooking service.

Write for catalog "Custom-Built Gas Ranges"

AMERICAN STOVE COMPANY · DEPT. B, 555 CHOUTEAU AVENUE, ST. LOUIS, MO.
Largest Makers of Gas Ranges in the World

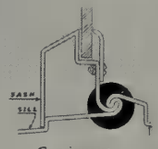


It Is a GOOD Gas Range That Has This Red Wheel

WINDOWS



IN-SWINGING TYPE
SEALAIR WINDOW



Continuous Water-proof hinge. Patents applied for.

VENTILATION
In-swinging Sashes permit controlled ventilation, without unpleasant drafts.

CLEANING
May be washed entirely from the inside.



Application of shade. Translucent glass in transom.

INSULATION
When closed, insulation between sash and frame protects against weather.

SAFETY
Difficult for anyone to fall or leap out.

NOISELESS
Sealair Windows will not rattle — operate easily, silently and independently.

Furnished in Bronze, Aluminum Alloy or Steel. All joints strongly welded.

Kawneer
SEALAIR
WINDOWS

THE KAWNEER COMPANY, NILES, MICHIGAN
KAWNEER MFG. CO., BERKELEY, CALIF. (SUBSIDIARY)
Manufacturers of
RUSTLESS METAL STORE FRONTS, WINDOWS AND DOORS

CLASSIFIED DIRECTORY OF ADVERTISERS

Alphabetical Index to Advertisers, Page 206

After reviewing advertisements in this issue—use Sweet's Architectural Catalogues for 1930 for catalogue and specification information on the products of the most of the manufacturers.

Acid Proof Chemical Stoneware
Knight, Maurice A.

Acoustical Installation—Armstrong Cork & Insulation Co.
Guastavino, R., Co.

Acoustics
Armstrong Cork & Insulation Co.
Boston Acoustical Eng. Division of Housing Company
Johns-Manville Corp.

Air Compressors
Westinghouse Traction Brake Co.

Air Conditioner
Airway Electric Appliance Corp.
American Blower Co.
Buffalo Forge Co.
Lewis Corporation

Air Washer
Buffalo Forge Co.

Aluminum
Aluminum Co. of America

Anchors—Concrete
Bulldog Floor Clip Co.

Arc Welding—Lincoln Electric Co.

Architectural Supplies
Higgins, Chas. M., & Co.

Artstone—Rackle, George, & Sons Co.

Asbestos—Johns-Manville Corporation

Balances, Sash—See Sash Balances

Basement, Windows—Steel
Detroit Steel Products Co.
Truscon Steel Company

Bathroom Accessories
Parker Charles Company

Beads—Corner Metal
Milcor Steel Co.
Truscon Steel Company
Wheeling Corrugating Co.

Beams, Angles, Channels, Etc.
Bethlehem Steel Co.
Carnegie Steel Company
Jones & Laughlin Steel Corp.

Belts—Dayton Rubber Mfg. Co.

Blackboards—Weber Costello Co.

Boiler and Pipe Covering
Johns-Manville Corporation
Ric-wiL Company

Boilers—American Gas Products Co.
American Radiator Co.
Bryan Steam Corp.
Dahlquist Mfg. Co.
Heggie-Simplex Boiler Co.
Pierce, Butler & Pierce Mfg. Co.
Smith, H. B., Company, The, Inc.
Titusville Iron Work Co.
Wood Gar Engineering Co.

Bolts—Door—Corbin, P. & F.

Brass and Bronze
See "Ornamental Metal"

Brass and Copper
See "Copper and Brass"

Brick—Finzer Bros. Clay Co.

Bridges—Steel—American Bridge Co.
Bethlehem Steel Co.

Builders—Stone & Webster, Inc.

Buildings—Steel
Carnegie Steel Company
Nat'l Assoc. of Flat Rolled Steel Mfrs.

Butts—Corbin, P. & F.
Stanley Works

Cabinet Work—Hyde-Murphy Co.

Cabinets—Kitchen
Olean Metal Cabinet Works, Inc.

Cabinets—Medicine—Parker Charles Company

Cabinets—Toilet Paper
Victoria Paper Mills Co.

Casement Operators—Rixson, Oscar C., Company

Casements—Crittall Casement Window Co.
Detroit Steel Products Co.
International Casement Co.
Mesker Bros. Iron Company
Truscon Steel Company

Cast Stone
Cast Stone Institute

Cellar Drainer
Penberthy Injector Co.

Cement—Louisville Cement Company
Medusa Portland Cement Co.
Portland Cement Association
Universal Atlas Cement Co.

Cement White
Medusa Portland Cement Co.

Chain Sash—American Chain Co., Inc.
Detroit Steel Products Co.
Smith & Egge Mfg. Co.

Chairs—Marble, B. L., Chair Co.

Channels—Carnegie Steel Co.
Concrete Engineering Co.
Jones & Laughlin Steel Corp.

Church Memorials
American Seating Company

Clamps—Lock Joint
Hyde-Murphy Co.

Clay Vitrified
Clay Products Association

Cleaning Systems
Spencer Turbine Co.

Clocks, Electric
Landis Eng. & Mfg. Co.

Columns, Porches, Etc.
Hartmann-Sanders Co.
Union Metal Mfg. Co.

Compressors—Air
Westinghouse Traction Brake Co.

Concrete Accelerator
Master Builders Co.
Solvay Sales Corp.

Concrete Construction—Reinforced
American Steel & Wire Company
Concrete Engineering Co.
Truscon Steel Company

Concrete Hardener
Master Builders Co.
Sonneborn, L., Sons, Incorporated
Solvay Sales Corp.

Concrete Piling—See Piling—Concrete

Concrete Ready Mixed
Transit Mixers, Inc.

Concrete Surface Treatment
Master Builders Co.
Solvay Sales Corp.

Conduit for Underground Heating Pipes
Ric-wiL Company

Conduits
Fibre Conduit Co.
Fretz-Moon Tube Co.
Garland Mfg. Co.

Conduo-Base
Conduo-Base Co.

Coping Wall
Clay Products Association

Copper and Brass
Revere Copper & Brass, Inc.

Copper Sheets
Revere Copper & Brass, Inc.

Cork Covering
Armstrong Cork & Insulation Co.

Cork Tile Flooring
Armstrong Cork Company, Custom Floors Dept.

Corkboard
Armstrong Cork & Insulation Co.

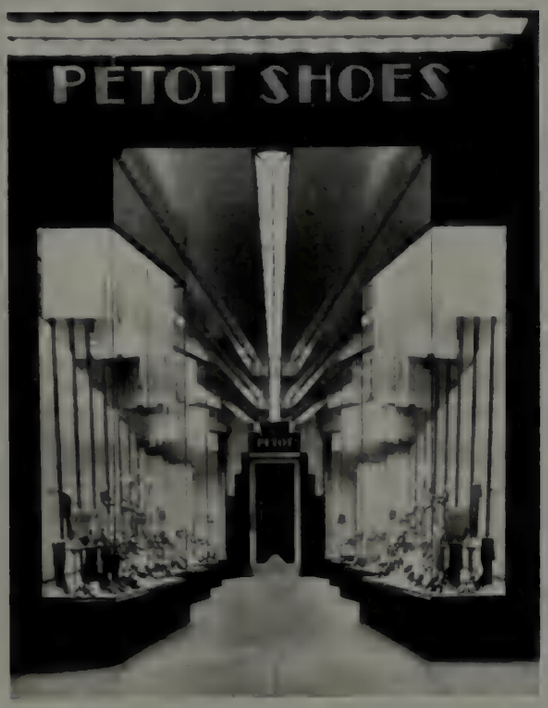
Covering—Pipe and Boiler
Armstrong Cork & Insulation Co.
Johns-Manville Corporation
Ric-wiL Company

Dishwasher—Conover Company

Door Closers—Corbin, P. & F.
Norton Door Closer Co.
Sargent & Company

Door and Window Frames
Andersen Frame Corp.

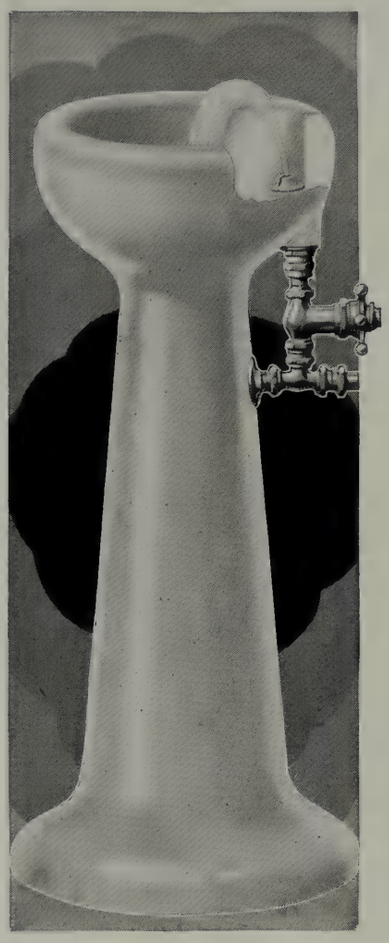
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Through years of experience, Kawneer craftsmen have acquired the art of rendering in metal (cast, drawn and extruded) distinctive and efficient store fronts of any size or design. Write for book of outstanding installations.

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BRONZE
STORE FRONTS

THE KAWNEER COMPANY, NILES, MICHIGAN
KAWNEER MFG. CO., BERKELEY, CALIF. (SUBSIDIARY)
Manufacturers of
RUSTLESS METAL STORE FRONTS, WINDOWS and DOORS



FOUNTAINS OF BEAUTY!

R-S Drinking Fountains are in keeping with the lines of present day architecture—pleasing, clean in design—they add much to public buildings, hotels, schools and other institutions.

There are many types and styles of R-S Fountains—but all have the R-S Vertico Slant feature. Let us give you full particulars. Write for catalog.

RUNDLE-SPENCE MFG. CO.
70 Fourth St. MILWAUKEE, WIS.

RUNDLE-SPENCE

Doors—Bayley, William, Company
Compound & Pyrono Door Co.
Dahlstrom Metallic Door Co.
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Ellison Bronze Co., Inc.
Hamlin, Irving
Hyde-Murphy Co.
International Casement Co.
Kawneer Company
Kinnear Mfg. Co.
Peelle Company, The
Roddis Lumber & Veneer Co.
Sanymetal Products Co.
Security Fire Door Co.
Thorp Fire Proof Door Company
United Metal Products Co.
Weis, Henry, Mfg. Co.
Wilson, J. G., Corp.
Zouri Co., The

Drains—Crampton-Farley Brass Co.
Josam Mfg. Co.

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Higgins, Chas. M., & Co.

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Dayton Rubber & Mfg. Co.

Electric Switches
Hart & Hegeman Mfg. Co.
Hubbell Harvey, Inc.

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American District Tel. Co.
Bryant Electric Company
Connecticut Tel. & Elec. Corp.
Fibre Conduit Co.
General Electric Company
Graybar Electric Co.
Hart & Hegeman Mfg. Co.
Holtzer-Cabot Electric Co.
Hubbell Harvey, Inc.
Imperial Electric Co.
Lincoln Electric Co.
National Electric Light Association
Westinghouse Electric & Mfg. Co.

Elevator Doors
Peelle Company, The
Security Fire Door Co.
Tyler Company
United Metal Products Co.

Elevator Inclosures
United Metal Products Co.

Elevators
Otis Elevator Company
Tyler Company
Westinghouse Electric Elevator Co.

Enamels
Du Pont de Nemours, E. I., & Co., Inc.
Pratt & Lambert, Inc.
U. S. Gutta Percha Paint Co.

Engineers—Inspection
Hunt, Robert W., Company

Expanded Casings—Milcor Steel Co.

Expanded Metal
Truscon Steel Company

Fence Post—Steel
American Steel & Wire Co.

Fence—Woven Wood
DuBois Fence & Garden Co., Inc.
Reeves, Robert C., Co.

Fences—American Steel & Wire Co.
Fiske, J. W., Iron Works

Finishing Lime
Ohio Hydrate & Supply Co.

Fire Exit Devices
Vonnegut Hardware Company

Fireplace Construction—Covert, H. W., Co.

Fireplace Unit—Heatilator Co.

Fireproof Doors, Shutters and Windows
Compound & Pyrono Door Co.
Dahlstrom Metallic Door Co.
Detroit Steel Products Co.
Kawneer Company
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Thorp Fire Proof Door Company
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Prominent Insurance Companies use Alberene Stair Treads



BELOW: *Alberene Stair Treads in Equitable Life Assurance Building.*



Insuring permanent satisfaction and no depreciation

1. DURABILITY—Alberene Stone stair treads have been in use for 21 years in the Provident Trust Company Building in Philadelphia. They have been, and still are, free of repair cost.
2. SAFETY—These treads are safe—wet or dry. They do not wear smooth, because the specially selected stone used for treads is high in abrasive content.
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5. APPEARANCE—The natural light, blue-grey color gives good visibility against any background, and it harmonizes with any color scheme.

For use in office buildings or any type of public building, Alberene Stone stair treads and landings offer the advantages given above and others equally important, such as ease of machining, economy of installation, etc. Send for Bulletin on Stair Treads and Interior Uses.

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NATIONAL CHAMBER OF COMMERCE BLDG., Wash'ton, D.C.	Cass Gilbert
PROVIDENT TRUST CO. BLDG., Philadelphia, Pa.	Rankin & Kellogg
CITY COURT BLDG., Buffalo, N. Y	Col. Howard Beck
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MAYO CLINIC BLDG., Rochester, Minn.	Ellerbe & Co.
PENN ATHLETIC CLUB, Philadelphia, Pa.	Zantzinger, Borie & Medary
SOUTHERN RAILWAY BLDG., Washington, D. C.	H. W. Hasselbach
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ALBERENE STONE CO., 153 W. 23rd St., New York, N. Y.

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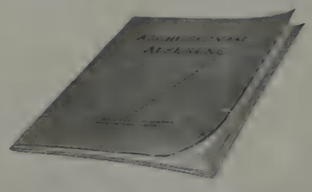
Quarries and Mills at Schuyler, Virginia



One of the quarries on the 6,000 acre tract at Schuyler, Virginia.

ALBERENE STONE

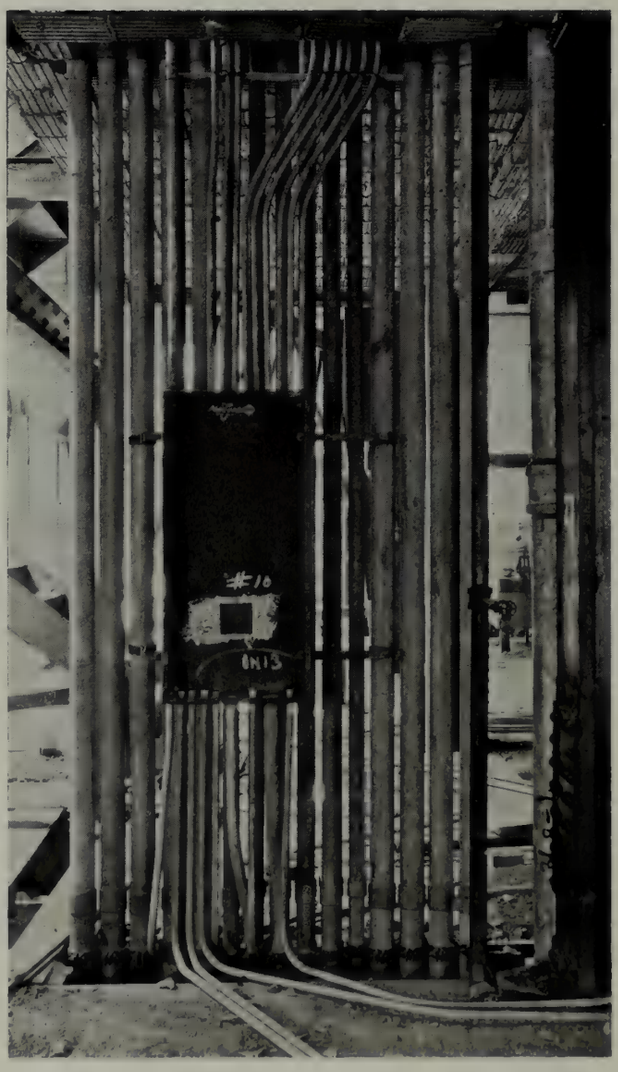
THE NATURAL STONE OF DIVERSIFIED UTILITY



This brochure, ARCHITECTURAL ALBERENE, *sets forth in detail the interior and exterior uses of Alberene Stone.*

Safeguard wiring systems

with rigid conduit. It's the sure way to guarantee permanence. No matter how small the building, rigid conduit will give better protection to the wiring.



For over thirty years Architects have been specifying Garland Conduit. This installation shows "GALVADUCT" in a Municipal Building.

Garland Mfg. Company
Pittsburgh Penna.

Fireproofing
See "Concrete Construction," "Covering, Pipe and Boiler," "Fireproof Doors, Shutters and Windows," "Lath-Metal,"

Flashing Wall
Cheney Company

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Carnegie Steel Co.

Floor Plates—Alan Wood Steel Co.
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Armstrong Cork Co. (Flooring Division)
Carter Bloxonend Flooring Co.
Cellized Oak Flooring Co.
Congoleum-Nairn, Inc.
Master Builders Co.
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Rivet Grip Steel Co.
Stedman Rubber Flooring Company
Structural Gypsum Corp.
Wright Rubber Products Co.
Zenitherm Company, Inc.

Flooring—Composition
Congoleum-Nairn, Inc.
Zenitherm Company, Inc.

Flooring—Wood Block—Builtup
Carter Bloxonend Flooring Co.

Floors—Fireproof—Alan Wood Steel Co.
Structural Gypsum Corp.

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Fountains—Drinking
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Taylor, Halsey W.

Furniture—American Seating Co.
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Hartmann-Sanders Company

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American Radiator Co.
Dahlquist Mfg. Co.

Gas Ranges—American Stove Company

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American Window Glass Co.
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Glass Wire—See Wire Glass

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National Bldg. Granite Quarries Assn.

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Gypsum Slabs—Atlantic Gypsum Products
Structural Gypsum Corp.

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Sargent & Company
Soss Manufacturing Company
Stanley Works
Vonnegut Hardware Company
Weis, Henry, Mfg. Co.
Yale & Towne Mfg. Co.

Heat Insulation
Johns-Manville Corporation
Ric-wiL Company

Heat Regulator Oven—American Stove Company

On an aisle of *Silence* . . .

Custom-built floors of cork assure the dignity of perfect quietness . . .



The First Methodist Episcopal Church, Green Bay, Wis. received Honorable Mention for Architectural Merit in the 2nd Annual Christian Herald Church Building Competition. Architect, Edward S. Jansson, Chicago. Associate Architects, Sundt & Wenner, Philadelphia.



Armstrong's Cork Tile, in the aisle of the Green Bay Church, hushes footsteps and harmonizes with the decorative plan of the sanctuary. The floor beneath the pews is of Armstrong's Linoleum.

PART of the beauty of every church service lies in the moments devoted to quiet meditation. Moments when we have no wish to be distracted by material disturbances. Unnecessary noise is ever out of place in the sanctuary of a church. And so a sanctuary should be built for silence.

Armstrong's Cork Tile Floors are made for silence. Their tiles, made from pure, resilient cork, cushion every footstep. No sound of scuffling feet, then, to interrupt the pastor's sermon. No echoing footsteps of a late arrival to mar the service.

You'll find Armstrong's Cork Tile to be a floor of unusual beauty, too. Because the tiles are hand-laid you can create any design you wish. There are three rich shades of brown and thirty-one standard tile sizes to choose from.

And from a practical point of view Armstrong's Cork Tile is logical for any church—for any public floor that must be quiet. This foot-easy floor shows remarkable resistance to wear and tear. Properly cared for, it lasts a lifetime.

Let us send you our illustrated booklet, "Custom-Built Floors of Cork." It will give you complete information about Cork Tile—and Linotile, another tailor-made Armstrong's Floor. Write to the Armstrong Cork Company, Custom Floors Department, Lancaster, Penna.

Armstrong's Ⓐ Product

Armstrong's Custom Floors

LINOTILE CORK TILE

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM

WESTCOS ON DUTY IN THIS BUILDING

The Eighteen Story Petroleum Building, Oklahoma City, Oklahoma.



WESTCO *TURBINE* PUMPS

SEE OUR Catalogue in SWEETS

WHEN steady water pressure must be maintained at high levels, you can rely on Westcos to handle the job.

Three Westco Turbine Pumps serve this towering building pictured above. Two 6F6 models are utilized as booster pumps while another Westco 3H6 unfailingly circulates ice water throughout the building.

Westco pumps, because of their wide operating range, are unaffected by fluctuations in city water pressure. The fact that Westcos are the ideal pumps for booster service in tall public buildings has been demonstrated by their record of successful installations.



REVIEW THE IMPORTANT WESTCO FEATURES LISTED BELOW

Wide operating range.
No end thrust at bearings due to perfect hydraulic balance.
Only one moving part.
No metal to metal contact.
High pressures in single stage.
Ball bearing construction.
Direct motor driven at standard motor speeds.
Capacities from 5 to 400 g.p.m.

Write for complete descriptive and performance data

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Factory and General Offices, Davenport, Iowa
Branches: NEW YORK · CHICAGO · SAN FRANCISCO

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Heating Apparatus
Aerofin Corporation
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Dunham, C. A., Company
Heatilator Co.
Heggie-Simplex Boiler Co.
Johnson, S. T., Co.
Marsh, J. P. & Co.
Nash Engineering Company
Nelson, Herman, Corp.
Peerless Unit Ventilation Co., Inc.
Pierce, Butler & Pierce Mfg. Co.
Roberts-Gordon Appliance Corp.
Smith, H. B., Company
Sturtevant, B. F., Co.
Titusville Iron Works Co.
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Hinges—Gravity
Sanymetal Products Co.

Hinges—Invisible
Soss Manufacturing Company

Humidifier
Lewis Corporation

Insulation—Armstrong Cork & Insulation Co.
Cabot Samuel, Inc.
Flax-li-num Insulating Co.
National Gypsum Co.
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Interior Communication System
Automatic Electric Co.
Connecticut Tel. & Elec. Corp.
Holtzer-Cabot Electric Co.

Kitchen Units
Conover Company
International Nickel Co.
Olean Metal Cabinet Works, Inc.

Lath—Metal—American Steel & Wire Co.
Milcor Steel Co.
Truscon Steel Company
Wheeling Corrugating Co.

Laundry Chutes—Pfaulder Co.

Lighting Control—Theatre
Adams, Frank, Electric Co.

Lighting Equipment
Belson Mfg. Co.
Graybar Electric Co.
Kliegl Bros.
Landis Eng. & Mfg. Co.
National Electric Light Assoc.
Pearlman, Victor S., & Co.
Smyser-Royer Company
Westinghouse Electric & Mfg. Co.

Lime—Kelley Island Lime & Transport Co.
National Mortar & Supply Co.
Ohio Hydrate & Supply Co.
National Lime Association

Limestone—Indiana Limestone Company
Victor Oolithic Stone Co.

Linoleum
Armstrong Cork Company, Custom Floors Dept.
Congoleum-Nairn, Inc.

Lockers—Steel
Nat'l Assoc. Flat Rolled Steel Mfrs.

Locks—Corbin, P. & F.
Norwalk Lock Co.
Russell & Erwin Mfg. Co.
Sargent & Company
Yale & Towne Mfg. Co.

Lumber—See Woods

Mail Chutes—Cutler Mail Chute Co.

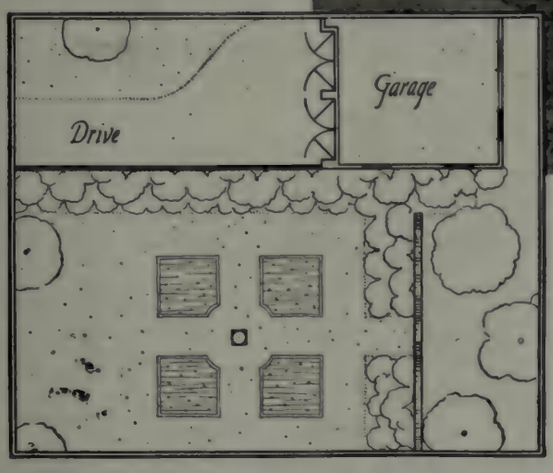
Mantels—Artificial Stone
Jacobson Mantel & Ornament Co.

Marble—Georgia Marble Company
Vermont Marble Co.

Where, Why & When to use *DUBOIS*



Vines cling easily to Dubois, and need never be torn down, as Dubois requires no painting.



Architect, F. M. GODWIN

Third of a series of specific applications to problems affecting the architectural ensemble

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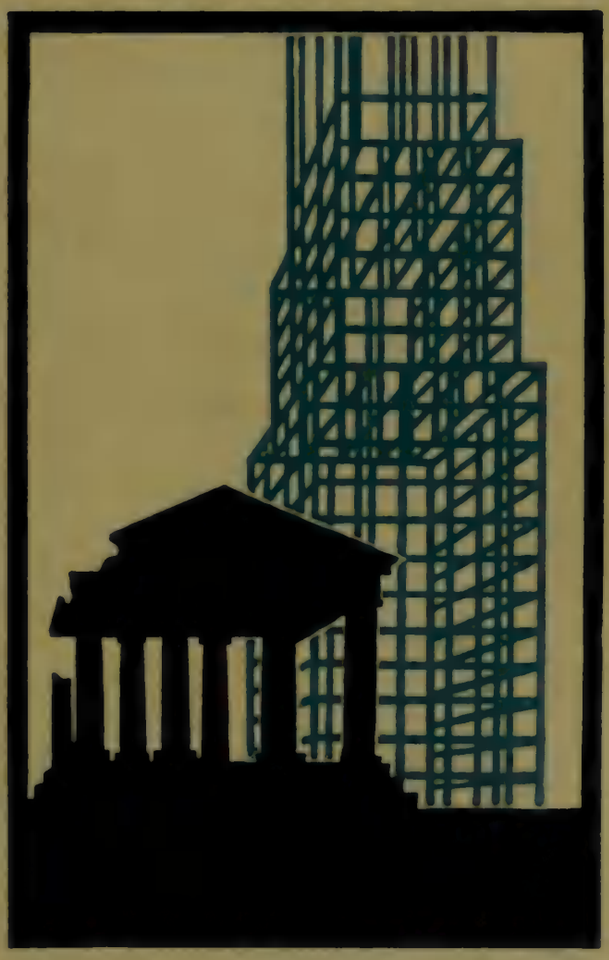
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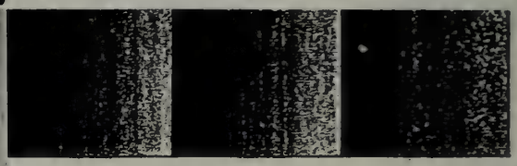
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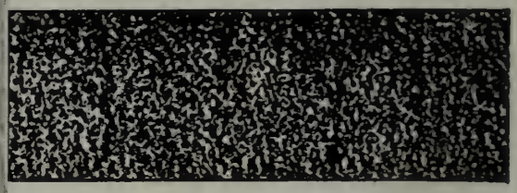
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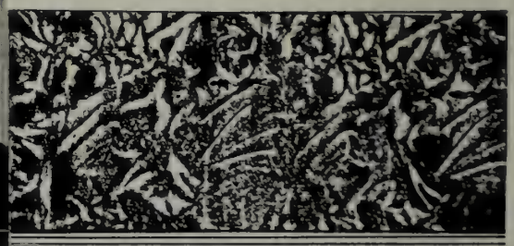








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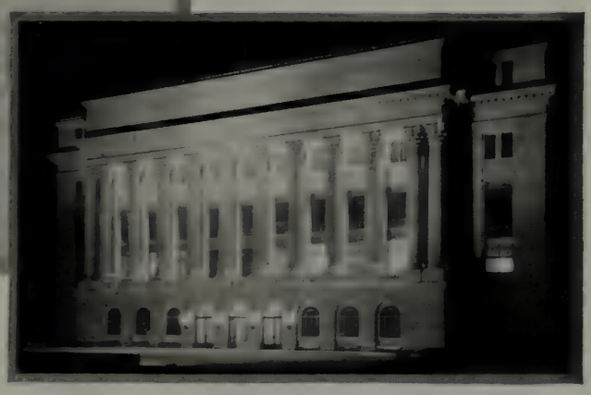


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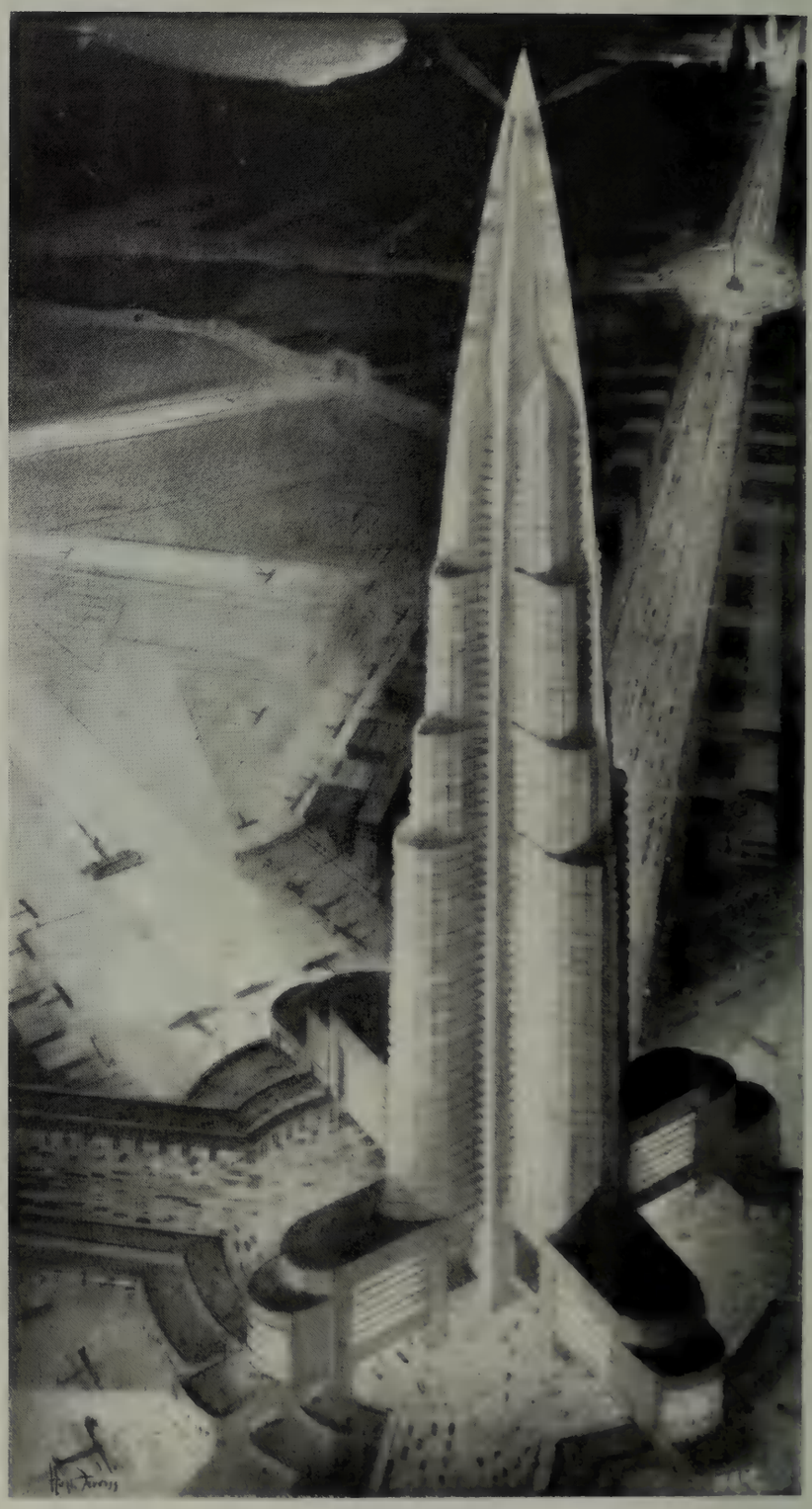
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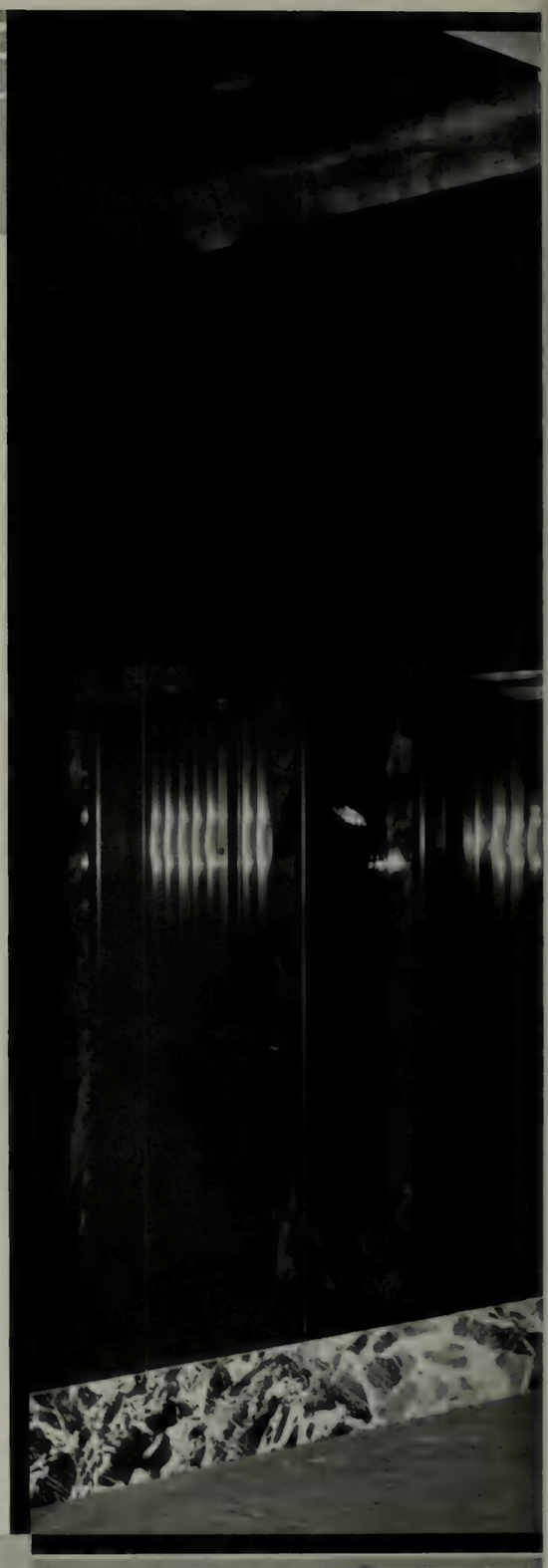
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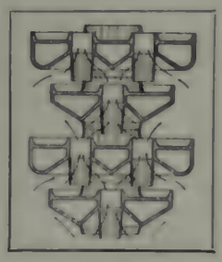
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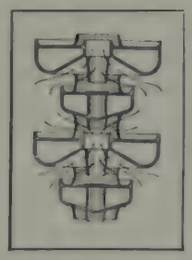
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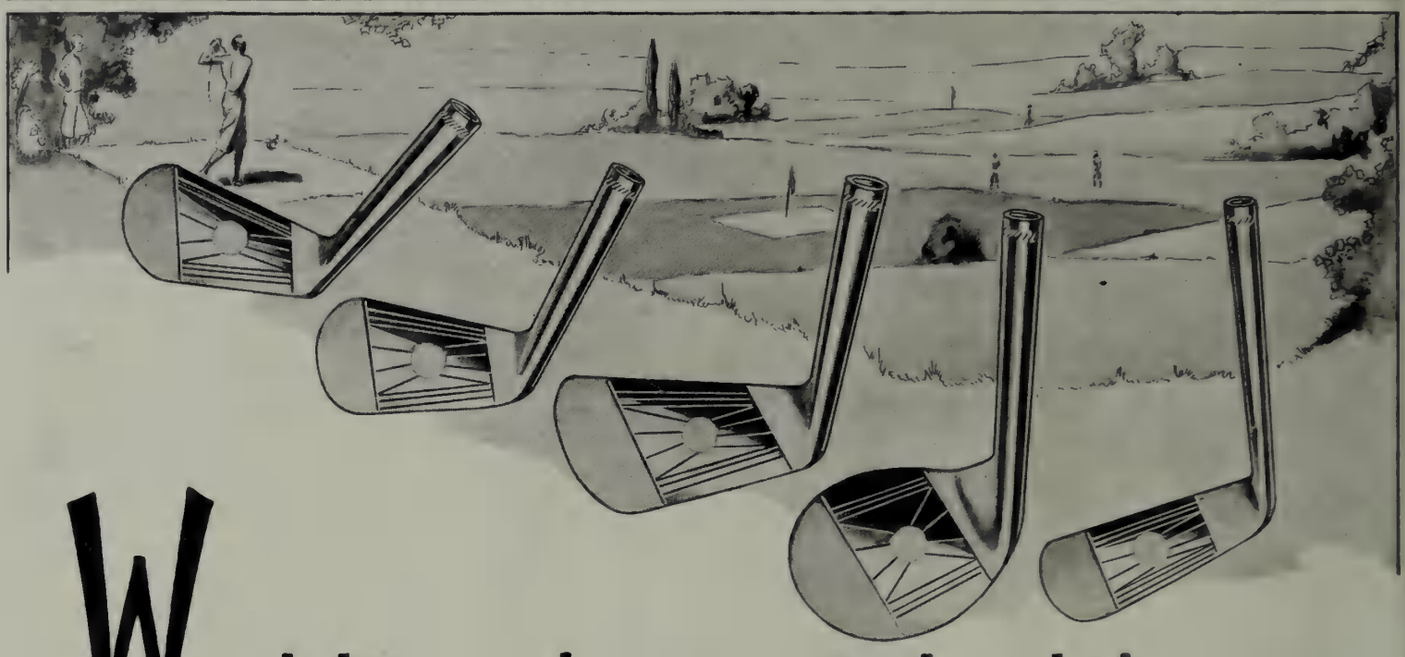
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On easy payments if desired

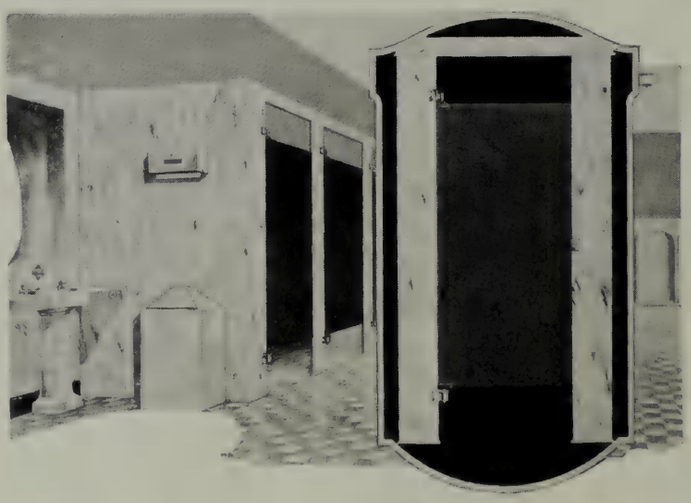
You'll want to specify the Doherty-Brehm Humidifier for new houses and recommend it to clients whose houses are already up. The price is surprisingly low. It is sold, through dependable heating contractors, by Doherty-Brehm Co. branches; also by Crane Co. branches under the Crane Budget Plan for 10% down, the balance monthly, if desired. See it at your nearest Crane Co. Branch or ask us to send a representative to explain it fully. Or we will mail you literature with full specifications and data.

DOHERTY-BREHM
HUMIDIFIER

THE DOHERTY-BREHM CO.
333 North Michigan Ave., Chicago



Would you buy a golf club without a shaft ?



METALUNITS are combinations of flush or panel type doors and the exclusive Weis Universal Gravity Hinge Set with other necessary door hardware items as may be selected. METALUNITS for use on lavatory stall partitions of marble, vitrolite, glass, slate, alberne stone, terrazzo, etc. are manufactured of steel, aluminum alloy, Monel or Allegheny Metal or b-onze. METALUNIT hardware is either chromium or ni kel plated with either flush or panel type doors available in a variety of interesting colors and finishes.

WEIS
METALUNIT
STALL DOOR AND HARDWARE

THE head of a golf club all by itself is as useless as a door without hinges or latch. Except when you break a shaft you never buy one part of a golf club without the other; when you buy a new club it is always complete, a single UNIT to accomplish a definite purpose. (Weis METALUNITS offer you the same simple choice; one specification covers doors and hardware, fitted to work together.) You save time and bother, the contractor saves time and bother and the owner saves money and gets unsurpassed quality in his building.

When METALUNITS are specified, stall doors and hardware come together and the door is already prepared for the application of the hardware.

New treatment of line, color and quality and new design, are made possible with Weis METALUNITS. Let us tell you the complete story.

THE HENRY WEIS MFG. COMPANY, INC.,
Elkhart, Indiana.

Turn now to the six-page insert in color in Sweet's, 1930 edition, following page B2388, for full information concerning Metalunits.



OUR CONTRIBUTION TO THE ART OF HEATING AND VENTILATION

The Herman Nelson Wedge Core Radiator is an exclusive feature of all Herman Nelson Heating and Ventilating Products and accounts for their satisfactory performance. + + + +

THE HERMAN NELSON CORPORATION MOLINE ILLINOIS



BEHIND THAT GRILLE IN THE WALL

To those of your clients who still consider radiators "a problem," the facts you can give them about the Herman Nelson Invisible Radiator will be a pleasant surprise.

Think what it will mean, for example, to say to them, "Here is a radiator so compact and so sturdy that it can be safely installed within the wall—out of view and out of the way."

Think how they will value your recommendation of a radiator that permits them to arrange their furniture and hang their draperies precisely as they choose; to carry out completely harmonious color schemes.

The Herman Nelson Invisible Radiator comes enclosed in a sturdy steel case which fits in any standard wall or partition. For multi-story buildings, where access to control valves is required, a special removable panel is provided. The radiator has no joints of any kind to leak and fail—no parts that can rust or get out of order.

If you are planning a residence or any building that will have a steam, hot water, vapor or vacuum heating system, you will insure your client's satisfaction by specifying Herman Nelson Invisible Radiators. Do you have our catalogue? A request will bring it to you.

THE HERMAN NELSON CORPORATION, *Moline, Ill.

There's a radiator that says... "This home is modern"

© 1930 T. H. N. Corp.

HERMAN NELSON *Invisible* RADIATOR

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*Makers of the *Herman Nelson Invisible Radiator*, for residences, apartments, hotels, offices and monumental structures—the *Unitvent*, for the ventilation of schools, offices, churches and all buildings having an acute ventilating problem—the *Herman Nelson hiJet Heater*, for economical distribution of heat in factories, mills, garages, warehouses, and smaller buildings.

This white cedar imparts beauty and dignity to every interior



This ceiling is an excellent example of the precision of Port Orford Cedar woodworking, and of its extreme smoothness for delicate and elaborate decoration. Residence of H. L. Thompson, Pasadena, California. Gordon B. Kaufmann, Architect

THE interior of a stately home, an English cottage or some magnificent public building assumes lasting dignity and beauty when Port Orford Cedar is selected for all interior trim.

Satin-smooth, this fine wood enamels to a beautiful and enduring porcelain-like finish. No trace of grain shows through. Never crinkles or blisters. Contains no pitch or rosin.

Trim, beams and panels of this cream-white cedar readily assume true, even, warm stains. Light and pliable, Port Orford Cedar works easily—never splinters and checks—holds nails with exceptional tenacity. Is free from pitch, rosin and knots. For special designs, it machines easily and with sharp, clean-cut edges. Port Orford Cedar's unusual resistance to corrosive agents makes it an outstanding wood for entrances, porch columns, garden furniture, storage batteries; bulkheading, decking, tunnel lining, boat building. Non-warping, it is ideal for Venetian Blinds, built-ins, etc.

Your local lumber dealer and millwork house has Port Orford Cedar lumber and plywood or can obtain standard grades and sizes promptly.

The coupon will bring you complete information about this fine wood. Mail it today.

PORT ORFORD CEDAR PRODUCTS COMPANY, Marshfield, Oregon

PORT ORFORD CEDAR

The Aristocrat of Woods



DANT & RUSSELL, INC., *Port Orford Cedar Sales Agents*, Dept. A. R. 830, Porter Building, Portland, Oregon
I am interested in Port Orford Cedar. Please send me free, your book "Port Orford Cedar—Its Properties and Uses"; also "Fine Interiors with Port Orford Cedar" by Wade Pipes, A. I. A.

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Now!

BLOX-ON-END FLOORS FOR NEW YORK CITY SCHOOLS

The two big gymnasiums (Boys' & Girls') in Seward Park School, illustrated above, have been floored with BLOX-ON-END.

Dr. A. K. Aldinger and Dr. A. P. Way, Department of Health Education, New York City Board of Education. W. C. Martin, Architect.

In Finer Schools Everywhere

Bloxonend is the one flooring material that combines beauty, long life, safety and utility. Its end-grain surface stays smooth and is resilient, fast and comfortable under foot. No slivers or splinters.

Bloxonend Flooring is widely used in handball and squash courts. Nearly all prominent school architects specify it for gymnasiums and school shops. Write for specifications.

CARTER BLOXONEND FLOORING COMPANY, Kansas City, Mo.

Branch Offices in Principal Cities—See Sweet's

BLOX-ON-END FLOORING



Bloxonend is made of Southern Pine with the tough end grain up. It comes in 8 ft. lengths with the blocks dovetailed endwise onto baseboards

Lays Smooth Stays Smooth

Bloxonend is used by leading industrials for floors subjected to severe usage.

Specify the Limit!

Any and all properties you may demand are possessed 100% by Sheldon's Slates

A Sheldon Slate roof is 100% fireproof.

Their color range covers all requirements.

In beauty, no roof can equal it.

Its permanence surpasses that of the building.

As to protection, that's also 100%.

Also adaptable to underfoot and many other uses.

Makes possible complete harmony with building and its setting, in pattern and texture as well as in color.

Deliveries on time assured, because all come from quarries we own and control.

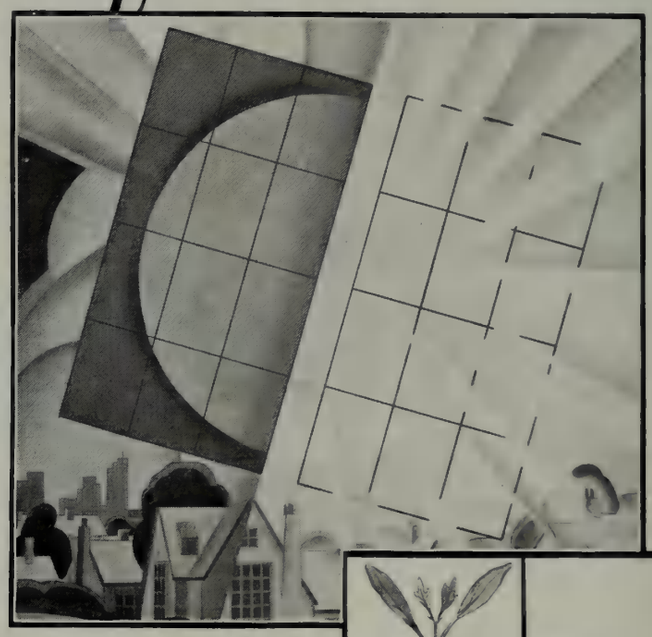


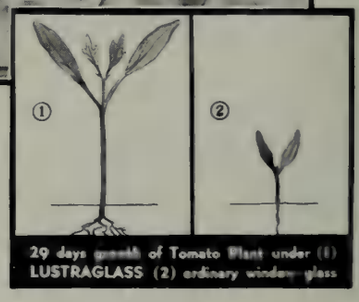
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29 days growth of Tomato Plant under (1) LUSTRAGLASS (2) ordinary window glass

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FLAT-DRAWN
. COSTS NO MORE

NO longer can scientists say that all window glass keeps out those vital ultra-violet rays of sunlight. LUSTRAGLASS transmits a substantial amount of the shorter ultra-violet rays of sunlight of a wave length of 313 mu.*, yet it costs no more than ordinary window glass.

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**Write for LUSTRAGLASS BOOKLET A-380 and Specification sheet showing complete table of transmission.*



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Makers of Quality Window Glass, Armor-Lite Scatter-Proof and Bullet-Proof Glass, 16 oz. Picture Glass, Photographic Dry Plate Glass, 3/16" and 1/32" Crystal Sheet, Ground and Chipped Glass, Improved Quartz-Lite and Bulb Edge Glass.

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3044

NAILING *into Concrete!*



Ebenezer Community Building, Chicago, showing how slate is nailed directly to the roof-deck of Federal Nailing Concrete Slabs. Archt., Andrew E. Norman.

Slate, ornamental tile, copper or other covering may be nailed directly and firmly to this permanent, fireproof, no-maintenance roof-deck. There are no wood nailing strips to rot out.

Of Haydite aggregate, Featherweight Nailing Concrete slabs also bring the further advantages of light weight and insulating qualities—offering roof value, without equal today.

Daily, more architects, engineers and contractors are taking advantage of this advanced roof construction—for prominent public buildings of all kinds. The list below is typical. Send for complete "Catalog and Roof Standards".

Featherweight Nailing CONCRETE ROOF SLABS

Some of the Many Modern Buildings On Which These Slabs Are Used

University of Chicago Chapel, Eckhart Hall, Oriental Building—De Vilbiss High School, Toledo—St. Aloysius Church, Detroit—Jackson County, Michigan Sanitarium—Minneapolis Water Works—Shedd Aquarium, Chicago—Marshall, Mich. High School—Illinois Reformatory, Dwight—Parker Jr. High School, Chicago—Haish Memorial Library, De Kalb, Ill.—Lincoln National Bank, Ft. Wayne.



Harrison School, Cedar Rapids, Iowa. The nailing slabs are ready for the roofing felt and ornamental tile or slate. Archt., H. E. Hunter.

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608 South Dearborn Street Chicago

FOR OVER A QUARTER CENTURY



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85th floor Please!

Truly a triumph of Structural Steel—the 85-story Empire State Building, now under construction in New York City! Carnegie Beams form the steel framework of this modern Colossus. The many unique advantages of these sections, responsible for their wide popularity, merit the investigation of those interested in efficient steel construction—whether for a bridge, a factory, or a building in which you ride to the eighty-fifth or walk up to the second.

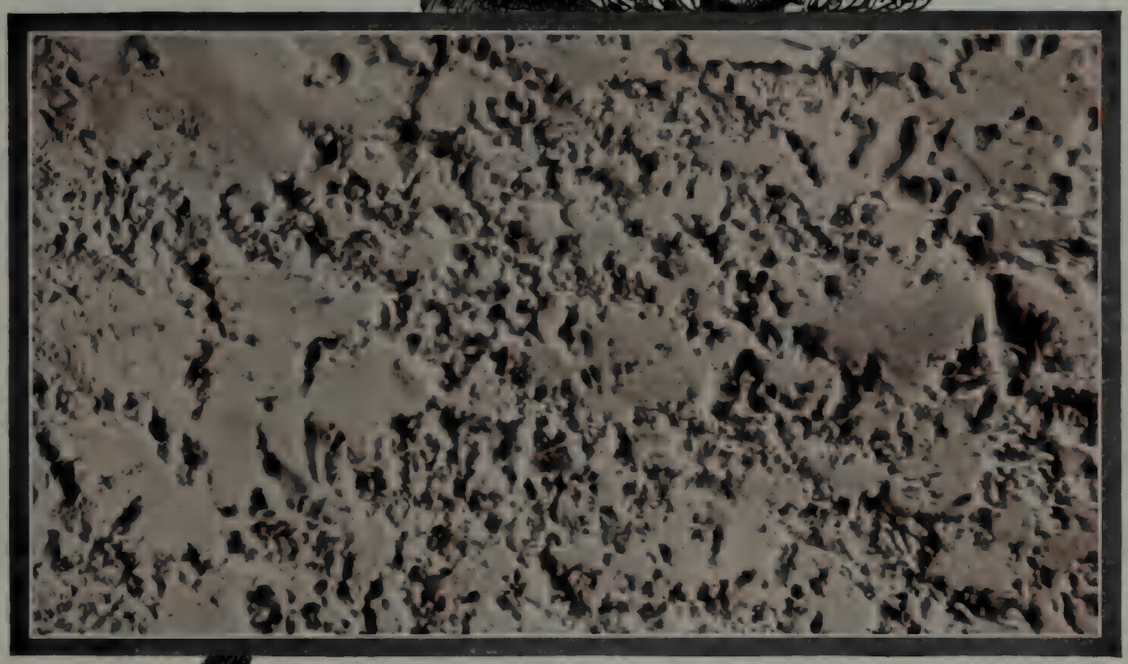
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Subsidiary of United States Steel Corporation

82

CARNEGIE BEAMS

"Spreads like warm butter"





Tiger "FOOTPRINTS" proclaim quality

When encountered on the trail of American Architecture, Tiger "Footprints" (ceiling and wall finishes and textures) are accorded prompt and favorable recognition. Always accepted as unquestioned marks of distinction, the unique charm of their individuality forcefully proclaims a quality structure throughout. These artistic Tiger creations are enjoying universal popularity, paying glowing tribute to their creators, the craftsmanship responsible for their being and the unusual working qualities of Tiger Finishing Lime.

SERPENTINE STIPPLE

Another Attractive Tiger "Footprint"

An exceptionally fine finish for the walls and ceilings of Banks, Theatres, Churches, Show-windows or massive rooms. Practically no limit to the color combinations which can be used. Heavy sponge treatment—flattened.

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"World's Largest Producer of Lime"

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The Famous TIGER FINISH

And—Tiger Mason's, Tiger Agricultural, Tiger Chemical, Tiger All-Purpose Hydrate in 10-lb. packages, and High Calcium and Magnesium Lump Limes. Also Quickslake (ground quicklime) in paper-lined jute sacks.

COPPER met the 4



The tower of the Manhattan Company Building as it actually appears. It rises 177 feet above the sixty-third floor.



An unusual perspective of the tower showing effect gained by the straight lines. The entire top is encased in Anaconda Copper.

Reproduction of the architect's original rendering of the tower.

• • •

H. Craig Severance, Inc., Architects

Yasuo Matsui, Associate Architect

Starrett Bros., Builders



Sheet metal workers applying the copper. The metal was fabricated in the shop from working drawings, making application on the job unusually fast.

ANACONDA COPPER

requirements for the roof *of the* MANHATTAN COMPANY BUILDING

The tower of the Manhattan Company Building represents the successful solution of an unusually difficult problem in architectural design. Rising to a height of nearly a thousand feet, bold handling of materials was required to endow the tower with a feeling of mass, and to accentuate light and shadow. Straight lines, alternating ribs or battens, flat surfaces and the high relief of a few decorative elements, all contributed to the final effect . . . In addition, by lead-coating the copper, the precise tonal values desired for the tower were achieved . . . But the tower did far more than demonstrate the adaptability of Anaconda Copper to the architects' decorative plans. It demonstrated the practical and economic advantages of copper as well. On this important project, the following four chief requirements in the selection of roofing material were completely met by Anaconda Copper:

COST: Standard widths of sheet copper were utilized in planning the design of the roof. This saved the expense of special cutting and forming operations. Great economies were thus effected. Furthermore, the *workability* of Anaconda Copper made it possible for the sheet metal contractor to fabricate the thousands of separate pieces and to complete the installation within the scheduled time.

TIME: It was determined to erect this building in one year, or less. Standard materials, therefore, were essential. The architect and contractor assured themselves of prompt deliveries by taking advantage of the extensive manufacturing facilities of The American Brass Company.

DURABILITY: For hundreds of years copper has been recognized as the most durable of roofing materials. In specifying copper for the tower of the Manhattan Company Building, the architect considered the hundreds of copper roofs which are still in excellent condition after a century or more of service. The use of Anaconda Copper assures that, barring accidents, the roof will outlast the building.

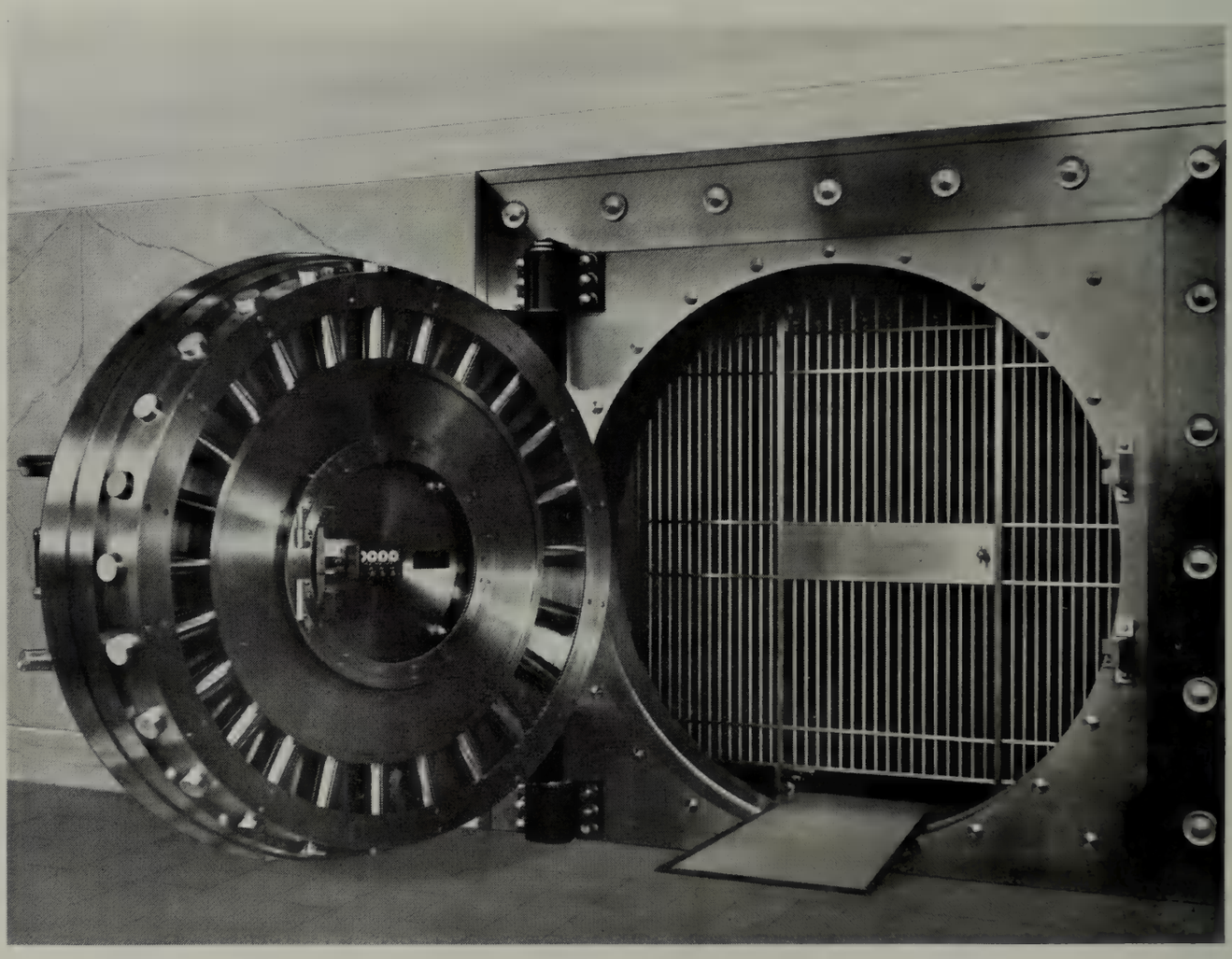
UPKEEP: Because of the durability of copper, the maintenance cost of a properly laid copper roof is extremely small. During the useful life of the Manhattan Company Building, the roof of this tower will require little or no upkeep expense.

The American Brass Company is always glad to cooperate with architects in solving problems involving the use of Copper, Brass and Bronze. A representative of the Company will call at your request. The American Brass Company, General Offices: Waterbury, Connecticut.

BRASS ANACONDA from mine to consumer BRONZE

★

Hand tooled



MASTERS at fitting and finishing put the final touch to Diebold Vault Doors . . . and with hand tools. That is why each one has about it a feeling of individualism that can't be produced from the mould of mass production ■ The Diebold Vault Door shown here weighs fifty tons. Yet it moves on its giant crane-hinge mounting to the touch of the hand. Closed and fully checked it withstands the most determined attack of expert cracksmen.

Diebold Safe and Lock Company

Canton, Ohio

SEVENTY YEARS OF BANK SERVICE

«Let's Build a Boiler like an Automobile Radiator»

. . . Said H. M. Jerome



The late H. M. Jerome, Automotive Engineer, scientist, and inventor.

WHY should a man noted for his successes in the field of automotive engineering concern himself with boilers for home heating? When a really scientific problem presents itself, a true inventor, once interested, cannot rest until it is solved. And Inventor Jerome was determined. He would perfect *an automatic heat machine that would deliver heat at low cost.*

The cooling system of an automobile engine and a house heating plant are much alike . . . both transfer heat. In an automobile motor the tremendous heat developed in the combustion chamber must be carried away. Water around the chamber absorbs the heat . . . passes it through the great number of small passageways in the radiator, which is exposed to the cool air, . . . and the heat from the water is radiated into the open air.

«Why not build a boiler like an automobile radiator,» reasoned Mr. Jerome. But, instead of exposing the «radiator» to the air and allowing it to throw off heat . . . expose it to the hot gases of combustion (from fuel oil or gas) and make it *absorb* the heat and pass it on into the heating system.

The high velocity flow, through the very irregular water and air passages of an automobile radiator, produces a turbulence that washes off the film of air, which by adhering to the metal reduces conductivity. The result is a greatly increased heat transfer. In the Gar-Wood, the combustion chamber is placed at the *top* of the boiler and well over one-half the fuel's radiant heat is absorbed by the water immediately surrounding the chamber. The remaining hot gases pass down into the narrow openings between a series of flat water tubes, which are baffled in such a way as to cause a scrubbing action of the hot gases against the steel walls of the tubes.★ The result is an almost complete transfer of the remaining heat into the water sections. Stack temperatures are held just high enough to prevent condensation.

★ The short, wide flues of the old type boiler are not built to absorb the intense heat produced by an oil burner.



Complete details of this most efficient and more economical balanced heating unit are to be found in our new book. The coupon brings it.

Gar Wood Engineering Co.
4196 Bellevue Ave., Detroit, Mich.
Gentlemen: Send me . . . *without cost or obligation* . . . a copy of "A New Principle of Generating Heat at Low Cost."

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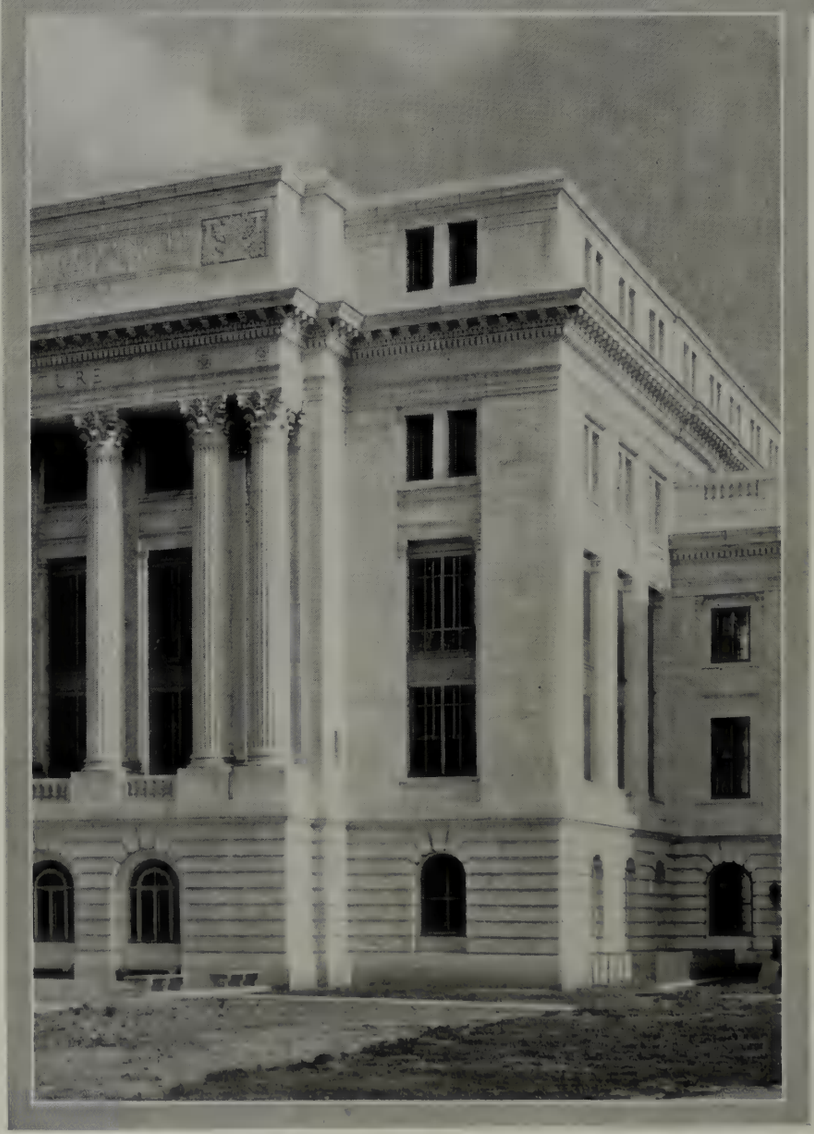


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Gar-Wood

GEORGIA MARBLE





DEPARTMENT OF AGRICULTURE
Washington, D. C.

BEAUTY *and* DURABILITY

THE use of Georgia Marble by the Government for one of its most important Department Buildings is sufficient evidence of its fitness for any building where beauty and durability are considerations. Only the new Administration Building in the centre of the group (close-up at left) is Georgia Marble.

Eight quarries operating both winter and summer insure uninterrupted deliveries.

JAS. A. WETMORE, *Acting Supervising Architect*, Treasury Department
THE GEO. HYMAN CONSTRUCTION CO., *Builders*

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Specify

THORP DOORS



MODERNIZATION— Begins in the Lobby

Although the McKnight Building is still one of the best rented office buildings in Minneapolis, its farsighted owners saw that it must soon struggle to keep pace with newer structures.

Realizing that the lobby gives the main impression of a building's tone, they had Hewitt & Brown, Inc., design new elevator enclosures for the ground floor. The Thorp Organization made the doors with their usual skill, following with scrupulous care the designs of the architects. The resulting effect is not only new, but imparts a strikingly modern feeling to the whole building.

The new elevator enclosures in the McKnight Building, Minneapolis, are etched nickeled silver with the design picked out in black. Hewitt & Brown, Inc. Architects.

THORP FIRE PROOF DOOR COMPANY
Minneapolis Minnesota

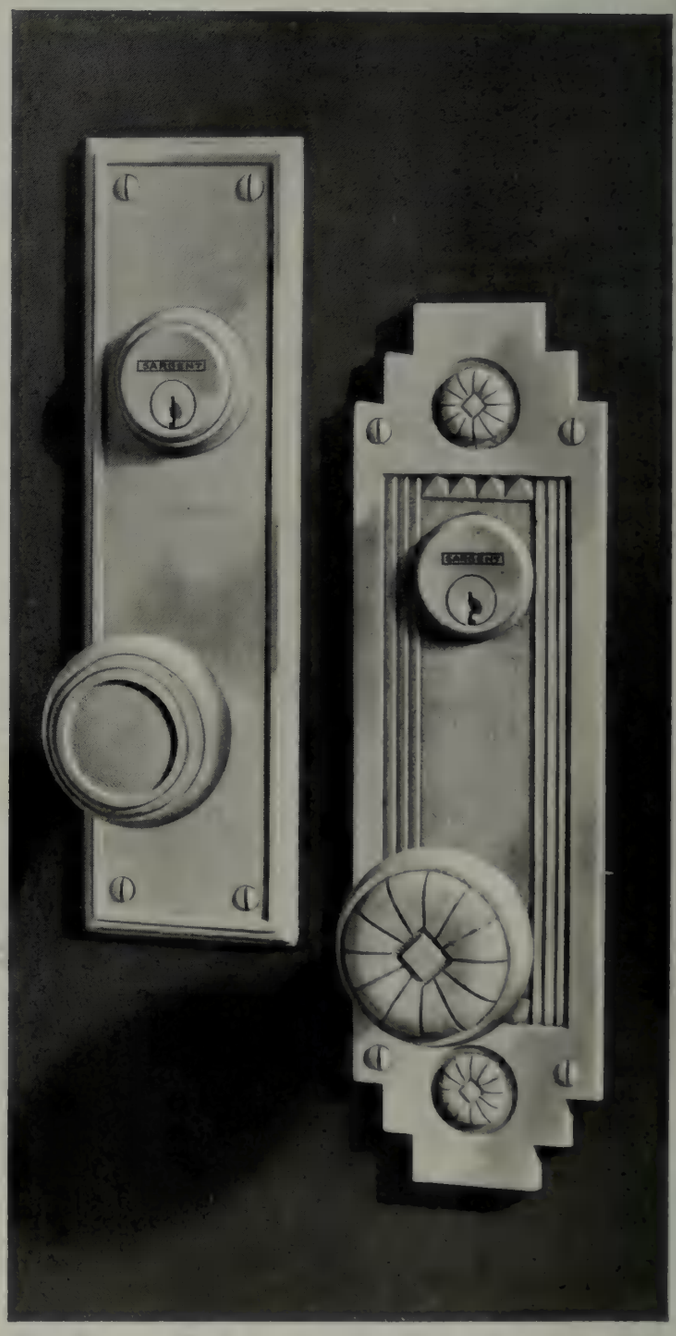
SARGENT HARDWARE

In Aluminum Alloy

SARGENT KEEPS in step with all the most modern trends in hardware manufacture. Designs appropriate for every style of decoration — authentic reproductions, artistic adaptations, modern designs expressive of the latest decorative tendencies. Materials and finishes that suit every building need — solid brass, solid bronze, white bronze of enduring silvery finish, rustless hand-forged black finish.

Sargent recently completed an equipment in aluminum alloy for the Aluminum Company of America. This new material for hardware brings out all the refinement of the design. It resists corrosion under all weather conditions. And its soft silvery sheen blends perfectly with all backgrounds.

The perfect operation, beauty, and durability of all Sargent Hardware can be depended on. Sargent & Company, New Haven, Connecticut; 94 Centre Street, New York City; 150 North Wacker Drive (at Randolph), Chicago, Illinois.



Two Sargent Hardware items made in aluminum alloy

SARGENT

LOCKS AND HARDWARE

TURNING PLANS INTO REALITY



WESTERN UNION TELEGRAPH COMPANY BUILDING, NEW YORK

TODAY—the development of American architecture has reached a plane that holds the undivided attention — the admiration and acclaim of the entire world.

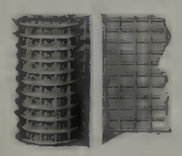
Today—the architect and builder are causing vast edifices to tower more and more toward the sky—to stand as enduring monuments to present standards of design and efficiency of materials.

Today—as in years past—the American Steel and Wire Company is supplying a major portion of the wire fabric (the steel backbone of concrete) that enables plans to be turned into reality.

So—we take justifiable pride in the confidence engendered by our products—and extend the full services of our engineering and technical staffs to the solution of specific reinforcement problems. Write to our nearest sales office for information and literature.



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Electric Weld Wire Fabric Reinforcement. Furnished in [illegible] or sheets.

Western Union Telegraph Company Building, New York, Voorhees, Gmelin & Walker, Architects. Marc Eidlitz & Son, General Contractors. Senn-Herricks Corp., Fireproofing Contractor.

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SPECIAL LUPTON WINDOWS FOR THE WORLD'S TALLEST BUILDING



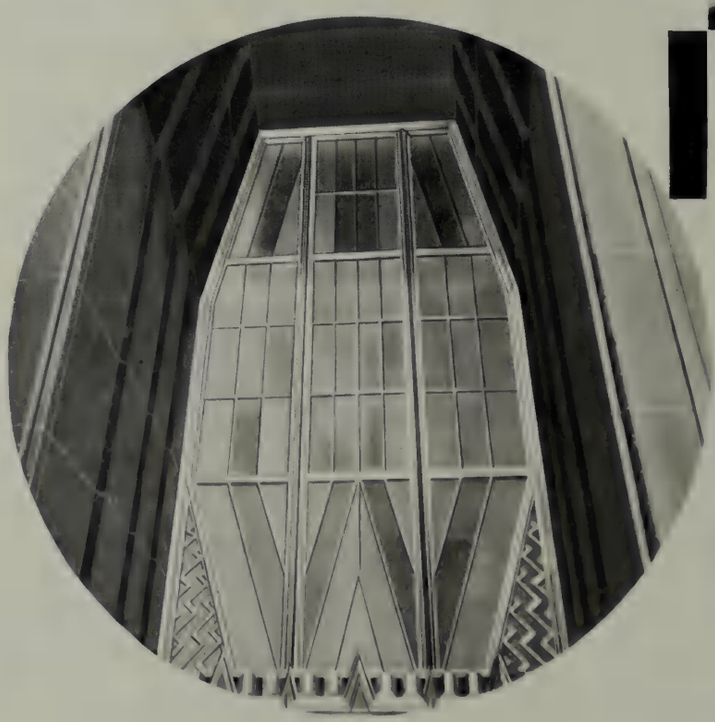
William Van Alen, *Architect*

UP IN THE CLOUDS and down on the street, from the Tower Dome to the sidewalk showroom, wherever a special window job was required, the Chrysler Building used Lupton Windows.

These included the store fronts on the street level, in the main lobby, and down in the subway basement. The two main entrances, a detail of which is shown in the circle, were Lupton made. The decorated steel panels, used at various places in the architecture, were also produced by Lupton.

In addition, the Lupton contract called for 78 special windows in the Tower Dome. All of these Lupton Products were done in Stainless Steel, a material whose gleaming finish adds much to the impressiveness of fine office buildings.

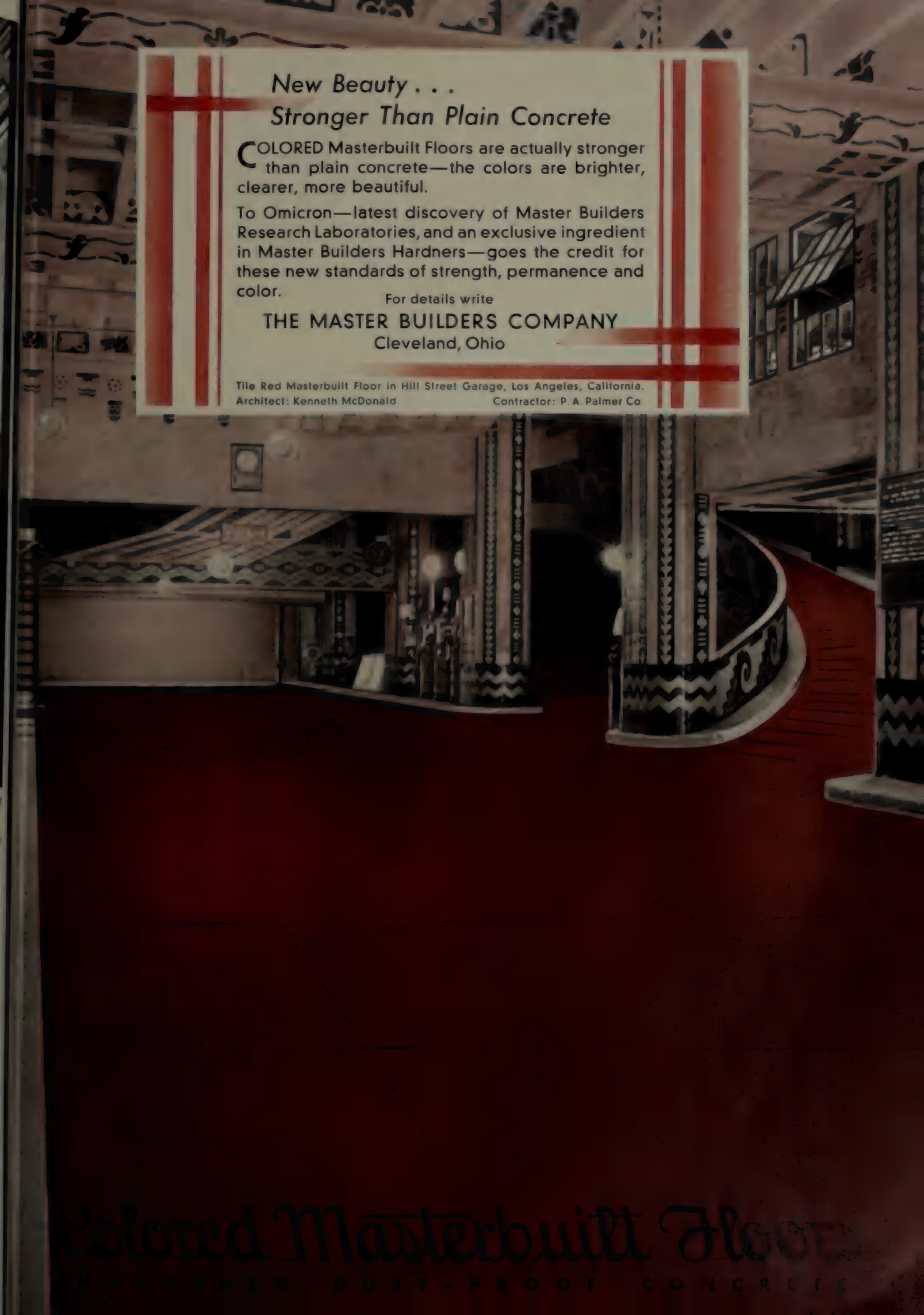
Wherever an unusual example of window craftsmanship is specified, Lupton is usually called in on the job. The Lupton organization has artisans who have given their lifetimes to the fabrication of fine steel windows. Their skill is supplemented by the finest of tools and materials.



Lupton is equally well known for its standard line of windows. You will find the details on these in your current edition of *Sweet's*. We will gladly consult with you on special jobs as well. David Lupton's Sons Company, 2209 East Allegheny Avenue, Philadelphia, Pennsylvania.

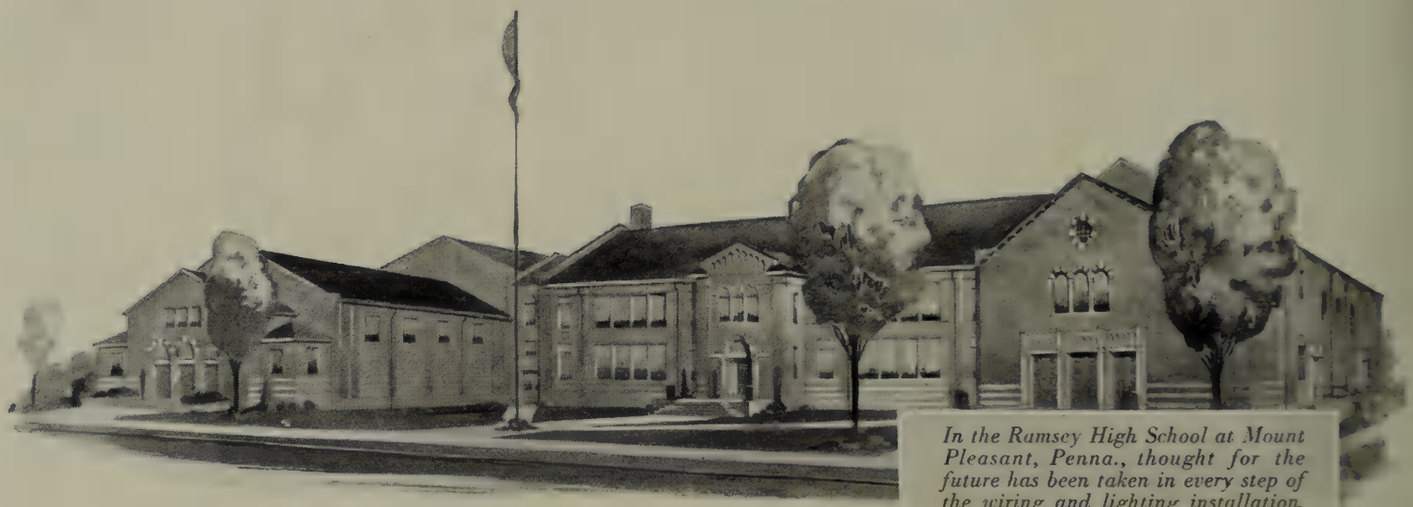
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Stronger Than Plain Concrete
COLORED Masterbuilt Floors are actually stronger than plain concrete—the colors are brighter, clearer, more beautiful.
To Omicron—latest discovery of Master Builders Research Laboratories, and an exclusive ingredient in Master Builders Hardners—goes the credit for these new standards of strength, permanence and color.
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THE MASTER BUILDERS COMPANY
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Tile Red Masterbuilt Floor in Hill Street Garage, Los Angeles, California.
Architect: Kenneth McDonald. Contractor: P. A. Palmer Co
Colored Masterbuilt Floors
HARDENED DUST-PROOF CONCRETE

FORESIGHT IN WIRING AND LIGHTING PRACTICE *helps to keep schools modern*

by RUSSELL G. HOWARD, *A. I. A., Registered Architect, Dubois, Penna.*



In the Ramsey High School at Mount Pleasant, Penna., thought for the future has been taken in every step of the wiring and lighting installation.

THE high school building that is to stay modern must be able to keep pace with the steady increase in the use of electricity called for by the specialized and vocational type of training that high schools provide today.

In the design of the Ramsey High School at Mount Pleasant, Penna., it was apparent that this trend raised special wiring and lighting problems. Electricity must be made available for light — for power — for special heating applications. Extra-curricular activities could not be forgotten, for the high school has become a center for social and athletic affairs that call for specialized lighting applications.

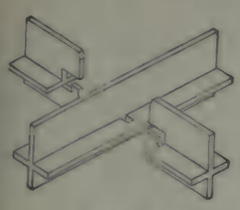
The recognition of a need for a practical basis by which to measure and provide for this increased use of electricity led to contact with the lighting and wiring service department, a non-commercial section of the local electric company. Here was found a thoroughly practical knowledge of the factors to be considered in avoiding an inadequate wiring installation and a broad perspective on which to base predictions of future requirements. The help and advice it furnished resulted in an electrical layout providing two circuits for each classroom, with a spare circuit for each five active circuits. No wire smaller than No. 12 was used and in every case the wire specified makes possible an increased use of light. In addition to the usual type of lighting in the gymnasium and auditorium, wiring for decorative lighting is provided, together with complete stage lighting equipment. All entrances are wired for flood lighting.

Wiring for purposes other than lighting is unusually complete, including heavy-duty convenience outlets for classrooms, lecture rooms and halls. There are motorized manual training rooms, and wiring for a public address and radio system, for television and for electric clocks.

It is not enough that buildings erected today be suitable only to today's conditions. They must be adaptable to developments of the kind that are typified in the ever increasing use of electricity.

For information about trends in lighting standards and about adequate wiring, call on the wiring bureau of your local electrical service company or write direct.

NATIONAL ELECTRIC LIGHT ASSOCIATION, 420 LEXINGTON AVENUE, NEW YORK



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Wrought Iron Window Sash Originators



The exterior view below shows the Little Rock Senior High School, Little Rock, Arkansas, in which modern American Seating Company posturally correct seats are used. Kiehnel & Elliott, Miami, Florida, were the architects. The smaller view at the top shows a typical arrangement of American Universal movable seating. Below, a modern school auditorium seated with comfortable upholstered assembly chairs with sound absorption values built in to aid acoustics.



The *Posture* Element in School Seating

There is more to the selection of school seating than merely providing children with something on which to sit.

School seats now perform other functions that science and modern education demand. Posturally correct school seating is recognized today as a decided factor in the physical and mental development of the child . . . a factor with which architects should reckon.

In specifying American Seating Company school seats, architects give school children all the physical and mental protection that science can provide. Seats that help the child sit erect, that help the lungs expand, that give the heart full freedom and give the spine a normally erect position.

The facts on how the American Seating Company school seat of today makes a major contribution to the general health, strength and mental progress of school children are available. Twelve authoritative booklets on school room posture and seating will be mailed, *free*, on request.

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Makers of Fine Seating for Churches, Schools and Theatres

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Dwight James Baum, Architect. Browning Painting Co., Painting Contractor

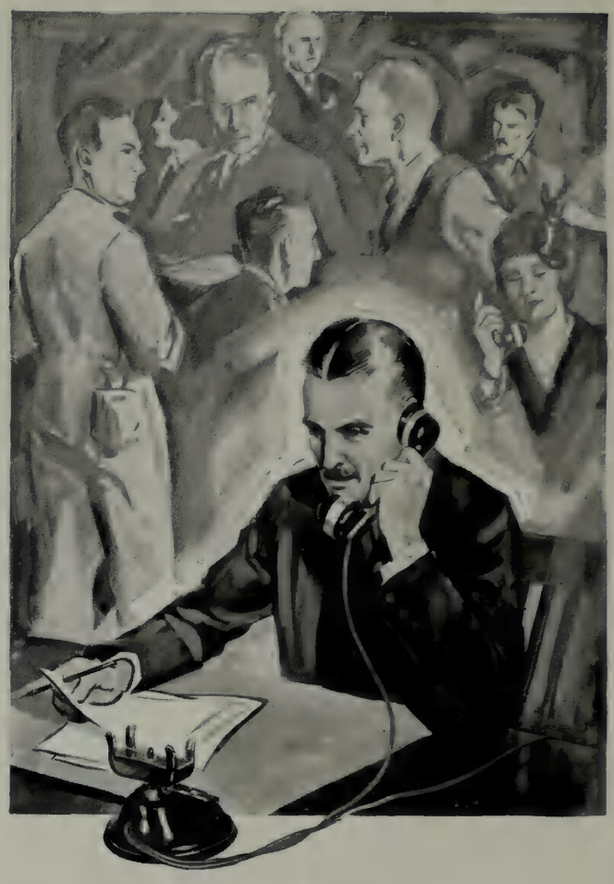
EXECUTIVES of the Y. M. C. A. regard the above new structure at 5 West 63rd Street, New York City, as the most complete of its kind. The walls and ceilings of this attractive 14-story building have been finished with Lyt-all, the Universal Wall Coating, insuring beauty, durability and low maintenance cost. Used for the finest residential work, its practicability, pure color and durability make Lyt-all ideal for wall work where superior results must be secured economically.

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Rectangular blocks 6" x 12" and 6¾" x 13½"; also in maple 6½" x 13". Square blocks, 13-16" thickness in the following sizes:						
6¾ in.	6¾ in.	6¾" & 7½"	*for walls*	6¾ in.	6¾ in.	*also in*
7½ in.	7½ in.	8 in.	*and ceilings*			*1 1-16" thickness in the following sizes:*
9 in.	9 in.	9 in.	6¾ in.	9 in.	9 in.	
		9½ in.	9 in.			
10½ in.		10 in.				
11¼ in.	11¼ in.	11¼ in.	11¼ in.	11¼ in.	11¼ in.	
12 in.	12 in.	12 in.				6¾ in.
		13 in.				9 in.

*For industrial floors, maple blocks are also fabricated 1 5-16" thick; 6¾" to 10" squares

Condensed Specification
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*CELLized Wood Floor Blocks are guaranteed. Laid only by Licensed Flooring Contractors.



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*CELLized Oak Flooring Inc.

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Sold through lumber dealers everywhere; manufactured by

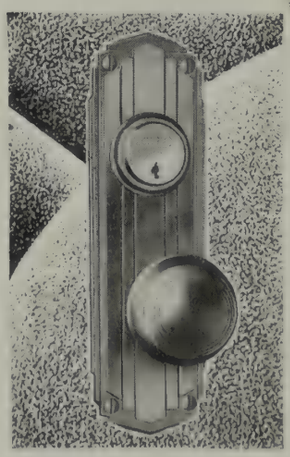
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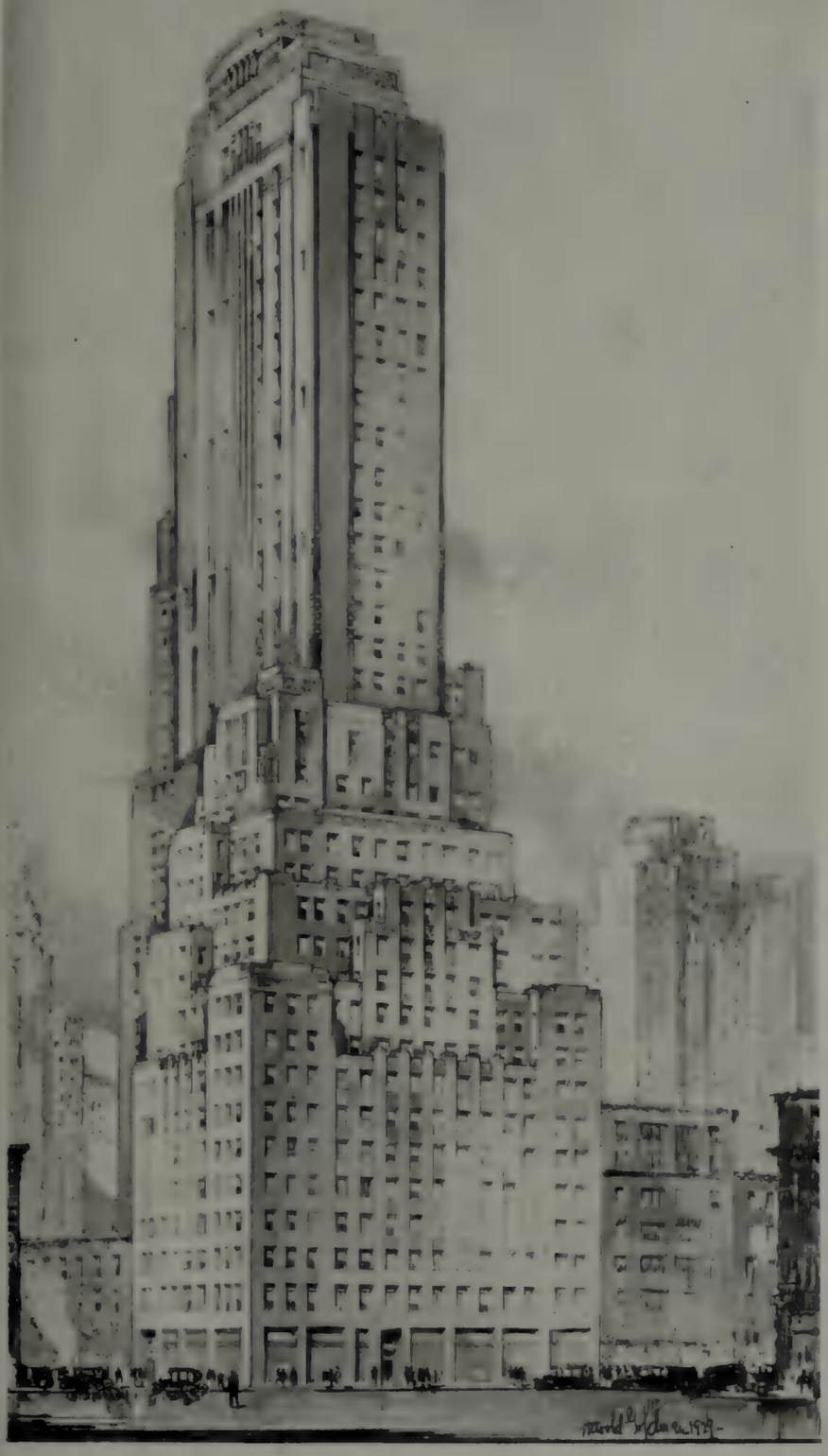




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ARCHITECT: LAFAYETTE A. GOLDSTONE

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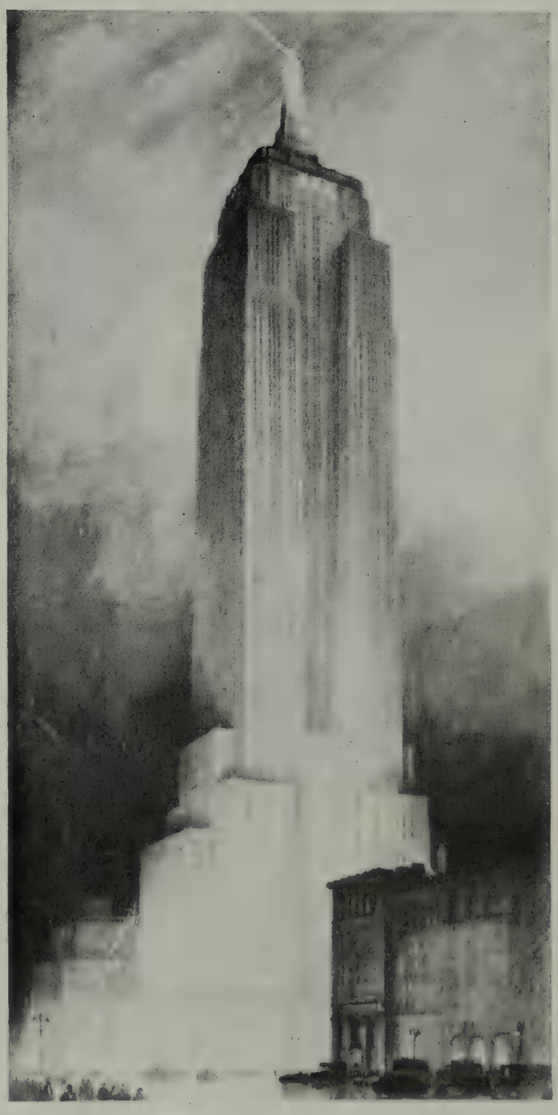
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Owner—*Empire State, Inc., 200 Madison Ave., N. Y. C.*

Architect—*Shreve, Lamb & Harmon, Architects, 11 E. 44th St., New York City.*

General Contractor—*Starrett Bros., Inc., 101 Park Avenue, New York City.*

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On 5th Ave. at 34th Street in New York a giant new building is going up—the Empire State Building—Shreve, Lamb & Harmon, Architects. The spandrels, alone, used for this structure have reduced weight by over 600 tons.

5704 spandrels cast of Alcoa Aluminum are being used. Being only ⅓ as heavy as other metals commonly used, they save twice their own weight. They save on handling costs from the first step in fabrication to the final setting into place. And they cost no more than would similar spandrels made of heavy old-fashioned metals.

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Alcoa Aluminum is, indeed, the modern material for the architect. It reduces weight, is attractive in color and appearance, can be fabricated in any shape or design.

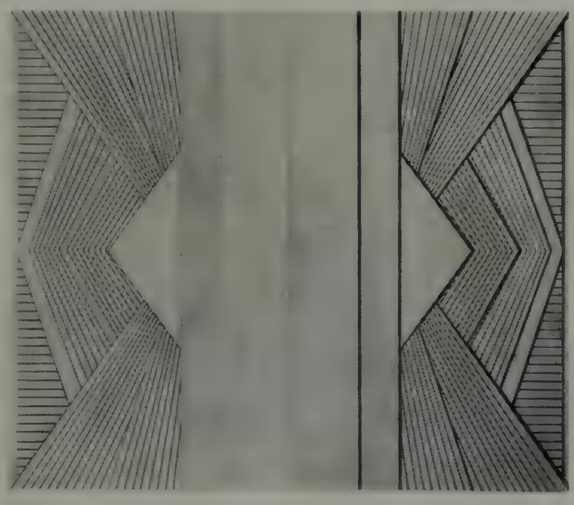
The use of Architectural Aluminum has spread rapidly in the past year. Our nearest office will gladly give you complete information on the use of Alcoa Aluminum for any purpose you may have in mind. ALUMINUM COMPANY *of* AMERICA; 2467 Oliver Building, PITTSBURGH, PENNSYLVANIA.

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"These Aluminum Spandrels shall be made of Alcoa No. 43 alloy, having a silicon content of 5%. The average tensile strength shall be 17,000 lbs. per sq. inch and an average elongation of 5% in two inches. The weight shall not exceed .097 pounds per cubic inch. The surface shall be free from imperfections and in all respects equal to sample submitted."

(Below) One of the 5704 Alcoa Aluminum Spandrels used on Empire State Building. Total weight approximately 600,000 lbs.



ALUMINUM



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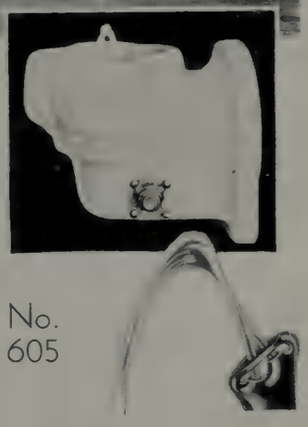


New laboratory, front entrance and front elevation of Aluminum Company of America at New Kensington, Penna. (P. R. L. Hogener, Architect; Fort Pitt Supply Co., Jobber)



...in this new laboratory its uses are developed

In using light, strong alloys of Alcoa Aluminum, the architectural field finds an almost magic metal at its finger tips, for the character of aluminum is such that a great saving in weight and handling is effected and new beauty and design is made possible. » Aluminum Company of America, in equipping this new and all-important research building, used Halsey Taylor Drinking Fountains, realizing in them a product as modern in its field as is aluminum. » » See Sweet's » » » The Halsey W. Taylor Company, Warren, Ohio.



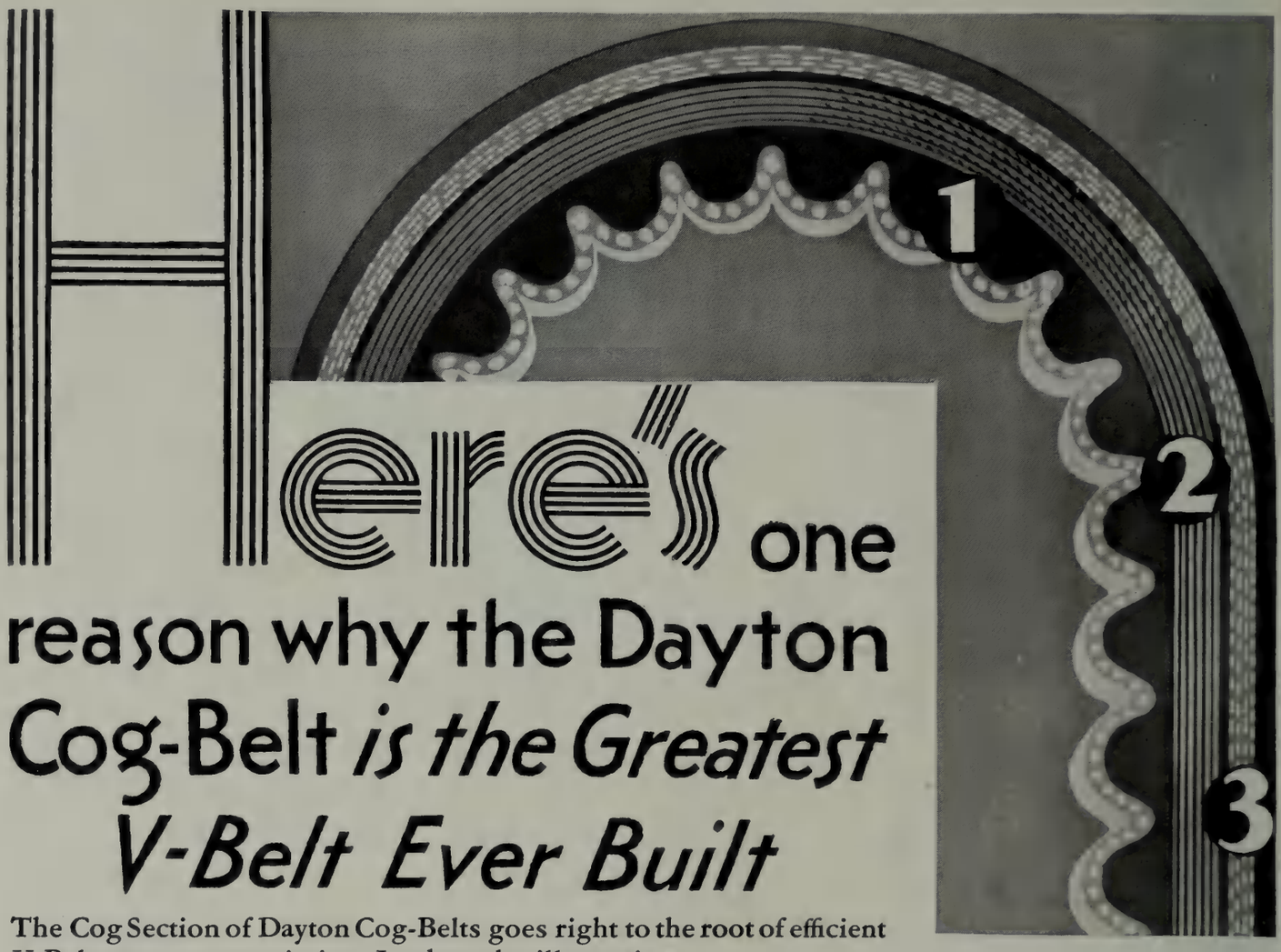
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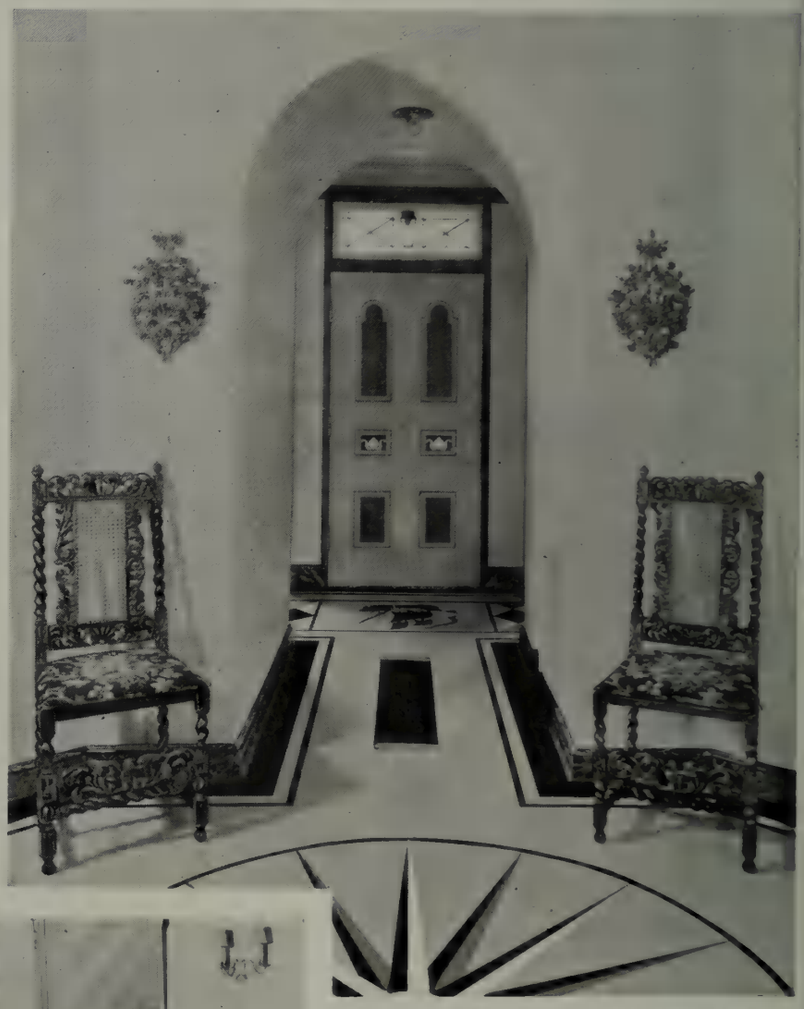
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The Bingham Plastometer

An instrument for measuring the viscosity of both clear and pigmented painting products. The method is to determine the rate of flow of the product through a capillary tube. The product is forced through the tube under a definite pressure. The length of time necessary for the material to flow a definite distance is the measure of viscosity.

...as BEAUTIFUL *as you make them*

The charm of custom-built floors depends solely on the ingenuity of the designer...



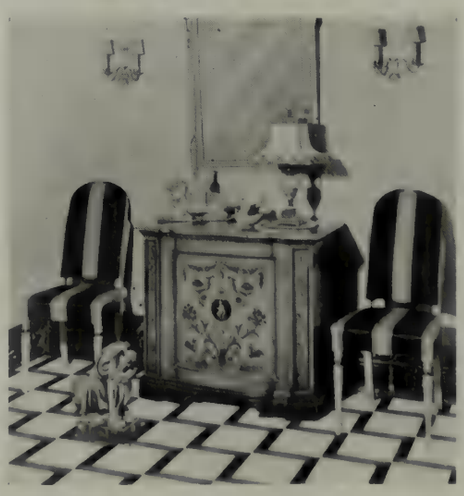
This custom-built floor is made from Armstrong's Linotile. The hall of a beautiful Buffalo residence, designed by Mr. Frederick J. Pike, interior decorator.

AN Armstrong's Linotile Floor can be as beautiful as the loveliest mosaic. Its appeal depends entirely on the pattern which the architect designs for it.

It makes no difference whether the room you are decorating is French, Moorish, Colonial, or Modernistic. An Armstrong's Linotile Floor can be created that will blend with any color scheme or fit into any room interior.

Whatever the taste of your clients may be, you can be sure that Linotile will please them. The rare beauty, the deep, rich colors attained by these floors will appeal to the home-owner and all her friends.

And their appeal will include not only beauty but utility, too. These warm, footstep-muffling floors give lifetime service. They are easily cleaned. They require very little attention to keep that "day-they-were-installed" look. Because of their splendid resistance to hard usage, Armstrong's Linotile Floors are just right for private residences—and for banks, stores, and other buildings where custom-laid floors can add that precise decorative effect.



Another Armstrong's Linotile Floor in the same home. The colors are black and gray. This was also created by Mr. Pike.

Let us send you our illustrated booklet, "Custom-Built Floors of Cork." It contains all the necessary information about Armstrong's Linotile. It will also tell you about Cork Tile, another Armstrong's tailor-made floor. Just write to the Armstrong Cork Company, Custom Floors Department, Lancaster, Pennsylvania.

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Armstrong's CUSTOM FLOORS

LINOTILE **CORK TILE**

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM

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inter-communicating systems

FOR EVERY NEED



9350W

Connecticut Floor Type Switch Board—capacity 50 lines. Especially designed for large apartments, hotels and industrials where it is not desirable to have the rental type of installation.

SHOWN on this page are integral units of various inter-communicating systems especially designed by the Connecticut Telephone and Electric Corporation for apartment houses, residences, hotels, schools, banks, hospitals, industrial plants, offices and theatres.

There is a perfected Connecticut inter-communicating system for every type and size of building.

These systems may be installed either at selected stations or to include connections on each floor with all departments, and building or home employees. Thus immediate instruction can be given and check-ups made. Without hurrying and scurrying all over the building, the staff may constantly be in touch with a central office or with one another. It is the efficient way to handle the management of any building.



6000W

Connecticut Cradle Phone is new in design and equipped with bakelite hand phone. Supplied complete with 6 foot mercerized cord and terminal block. May be substituted for conventional desk type phone. Removing hand phone connects the instrument to the talking circuit. Is furnished with 4, 6, or ■ buttons. Finish is dull black.



520W

Connecticut Surface Wall Telephone fitted with standard transmitter and receiver. Button spring mechanism assembled as separate unit independent of cover containing the line terminals on a metal frame and mounted within the cabinet. Cardholders furnished with transparent celluloid strips to protect ■■■■ cards. Standard finish golden oak with nickel trim. Furnished in multiples of four buttons. Phones similar to the 520W are for smaller installations and can be supplied for either common talking, selective ringing, or selective, non-interfering service, as desired.



41W

Connecticut Surface Wall Telephone has hinged metal case, standard transmitter and receiver, double gong bell, and one button for calling central. All outgoing wiring in hinged front is cabled to terminals on face of back. Terminal screws threaded into brass bushings. Back drilled fir single-gang outlet box mounting. Finished in baked black enamel.

DISTRICT FACTORY REPRESENTATIVES

Connecticut Telephone and Electric Corporation

The companies listed below are represented by qualified engineers in every case. They will gladly supply any architect, owner, engineer or contractor with complete information concerning Connecticut signal systems, recommend the best equipment for their particular job and assist with the laying out of the system.

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CHARLOTTE, N. C., Lydon, Cousart & Weeks, 304-5 Builders Building
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CINCINNATI, OHIO, Stifel Equipment Co., 622 Broadway
CLEVELAND, OHIO, O. H. Nickerson & CO., 720 Guarantee Title Building
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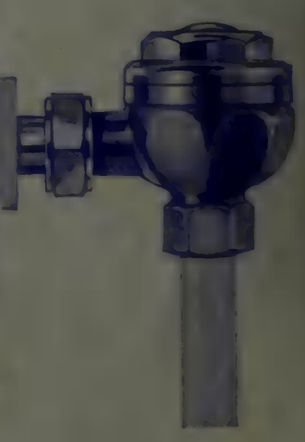
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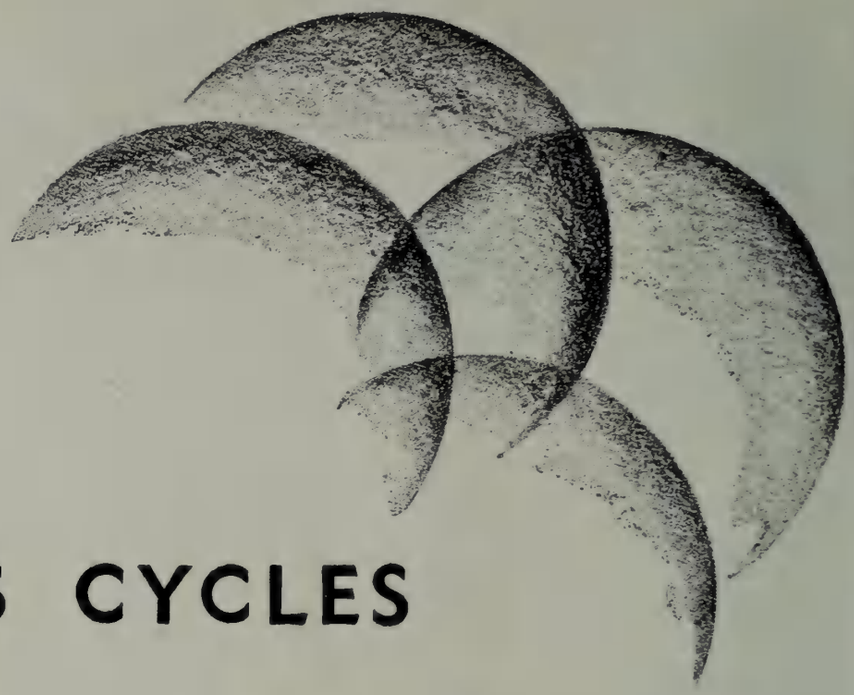


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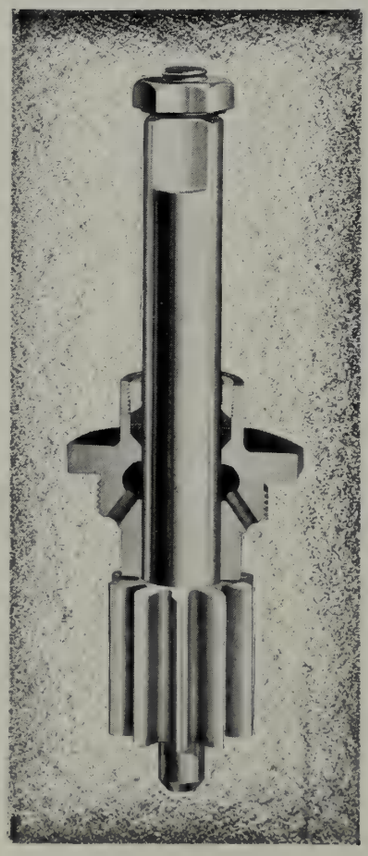
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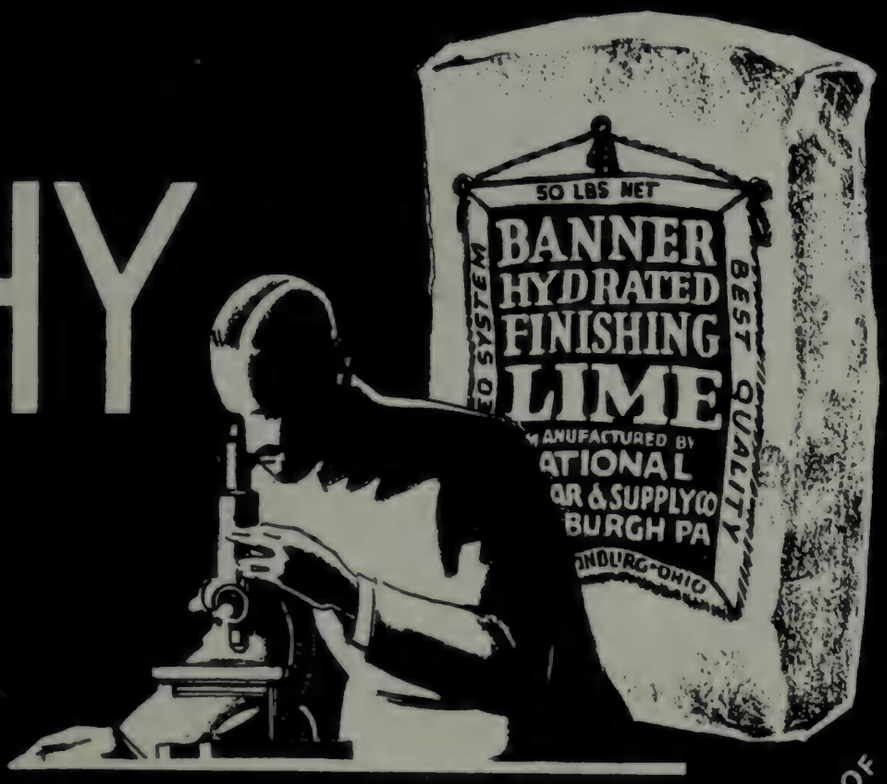
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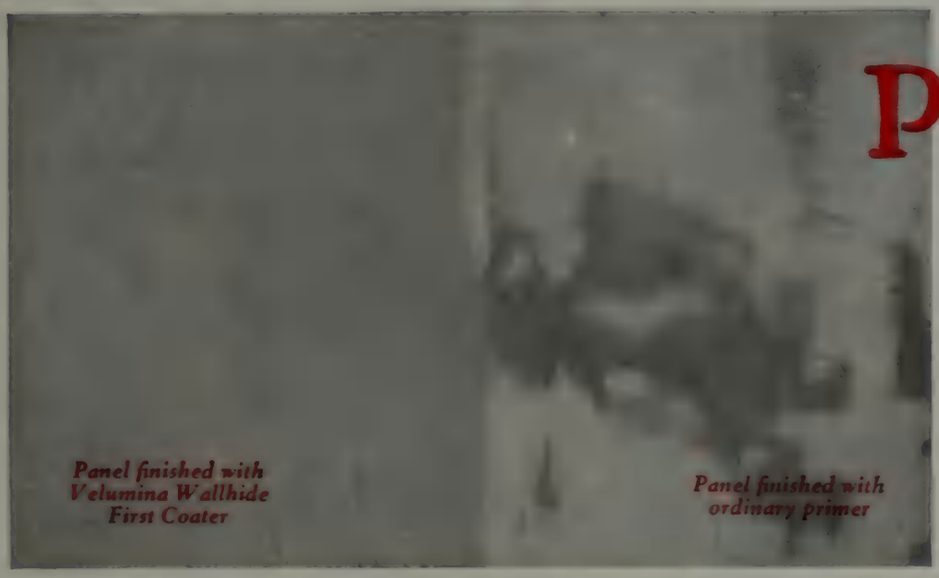
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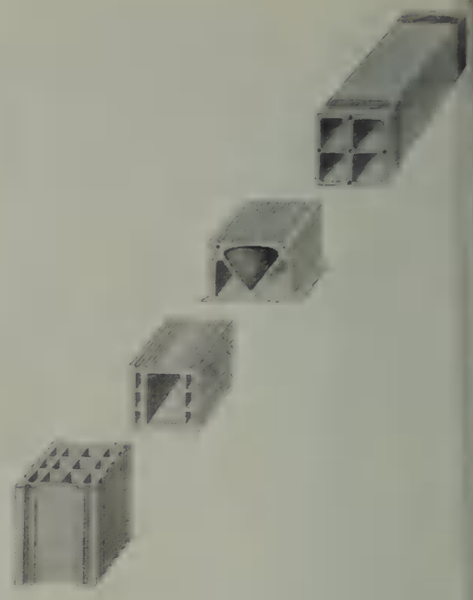
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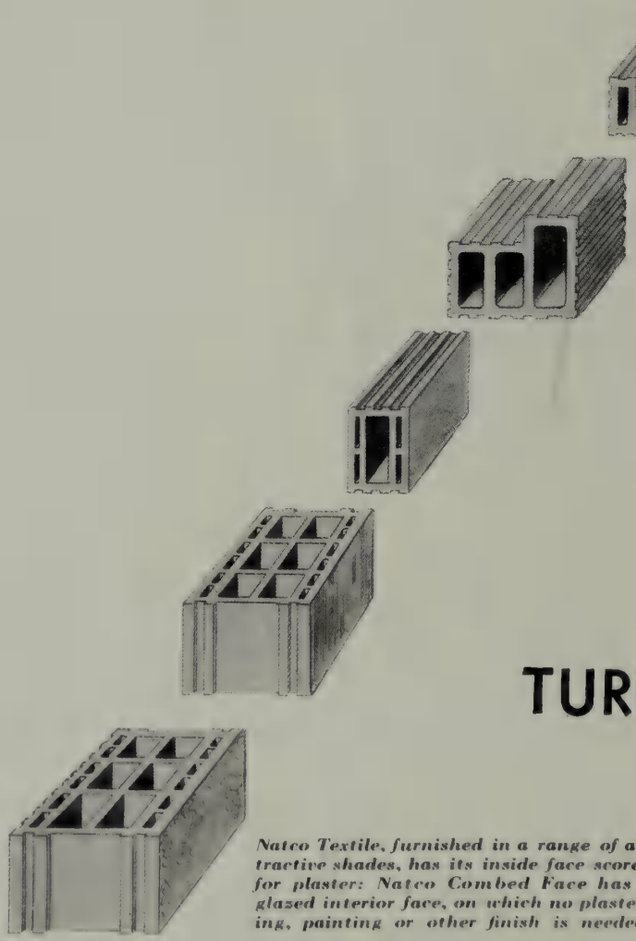
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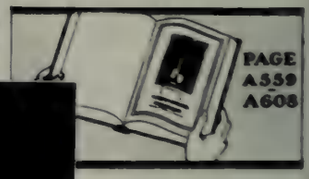


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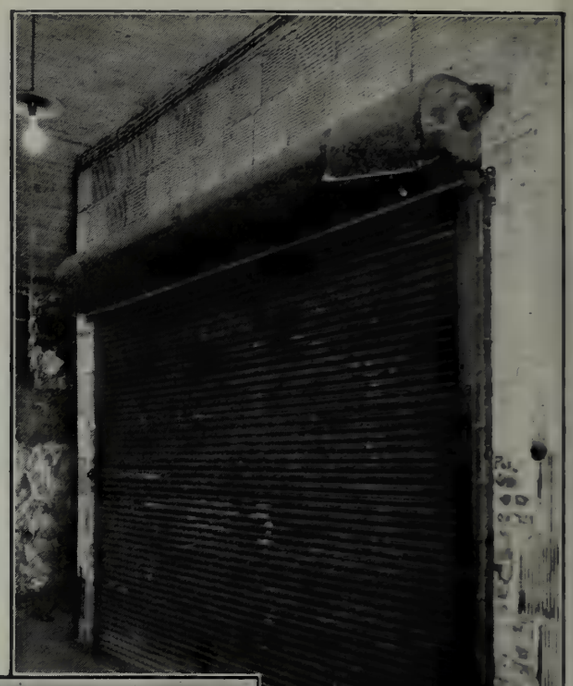
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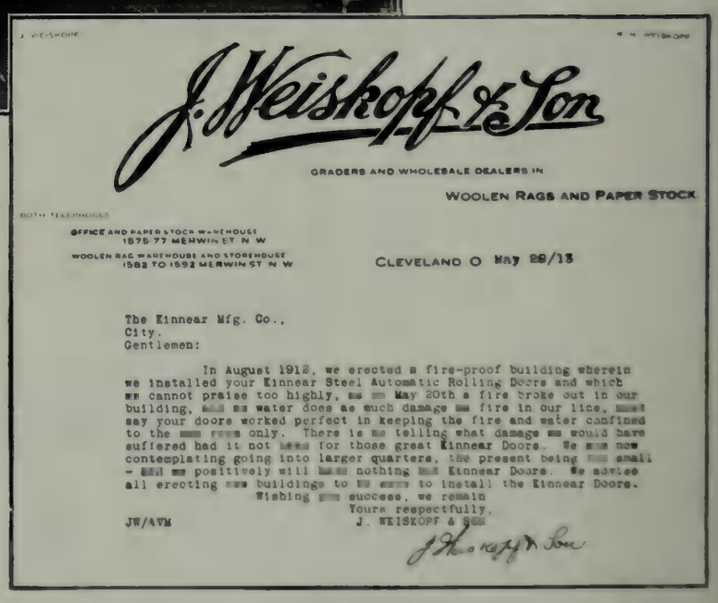


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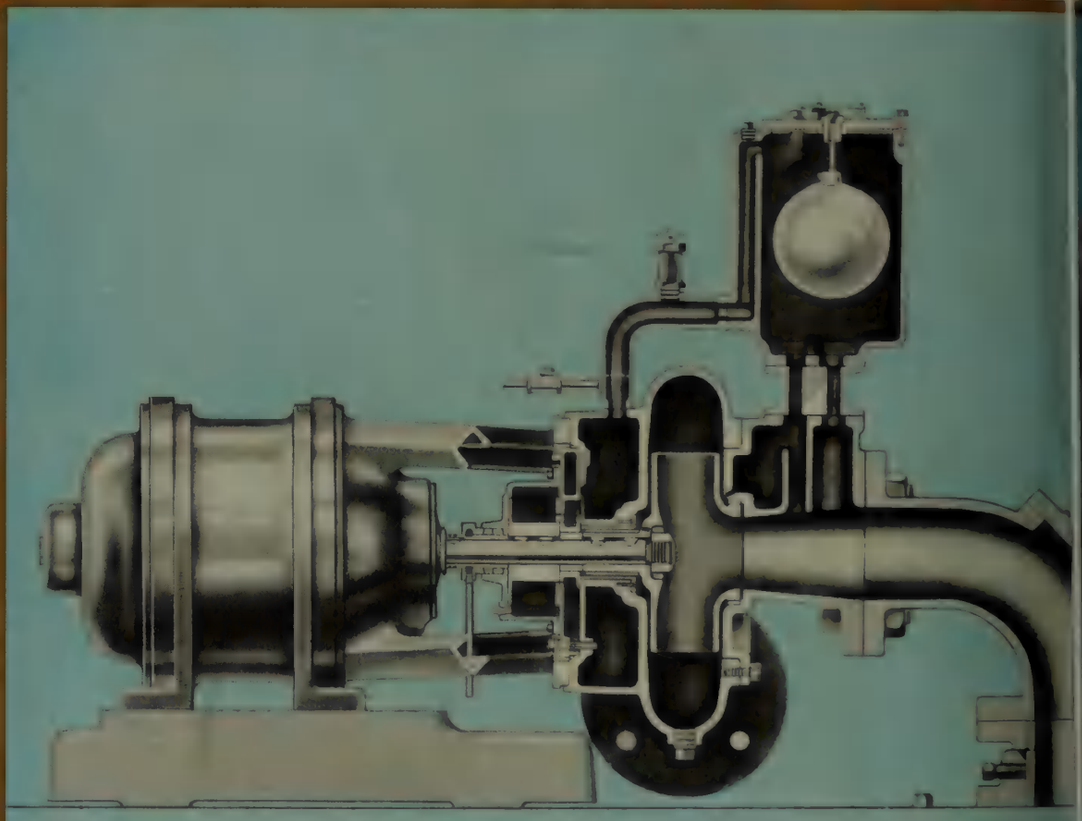
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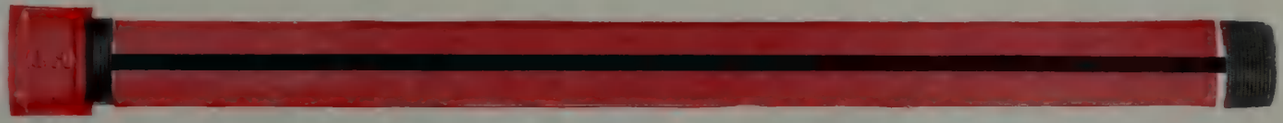
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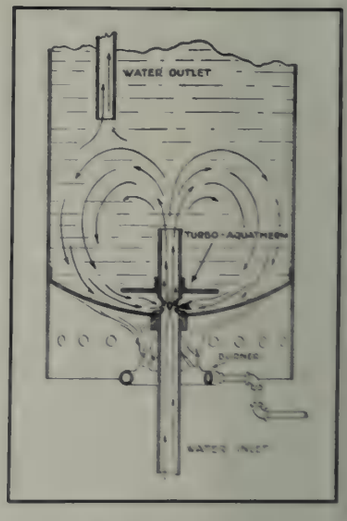
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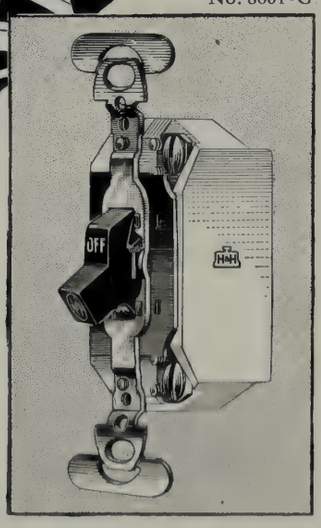
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FEATURED IN THIS ISSUE •



WEEK-END HOUSE BY KARL MEINHARDT, ARCHITECT

THE WEEK-END HOUSE
Pages 177–192

The week-end house is more than a sentimental stage setting. In addition to giving specific data to the architect who is occasionally called on to do this type of work, this Technical News and Research article suggests the possibility of further experimentation for the development of a dwelling which will be within the reach of the average wage earner.

HOW SMALL A HOUSE —OR APARTMENT?
Pages 131–137

The MINIMAL HOUSE solution by Le Corbusier and P. Jeanneret shows an amplification of the typical kitchenette apartment layout. The plan, it will be observed, is based on the principle of double-utilization of rooms, both by day and by night—which also distinguishes the "efficiency" apartment. In most apartments little consideration is given to children. In the MINIMAL HOUSE accommodations are provided for as many as four children in each family. For these reasons it is felt that this particular scheme offers a special interest to those architects engaged in apartment house planning who are seeking to conserve floor area.

TERMINALS? • TRANSFER!
Pages 99–106

An airport like any other link in the modern network of transportation, should be designed not as a terminus but as a transfer, according to Richard J. Neutra, architect. With plans and a model he illustrates his point that on leaving the planes both travelers and freight should be easily, rapidly and inexpensively directed into the other transportation lines of the regional traffic system. The article is supplemented by views of the airport at Hamburg, Germany, showing this relationship of air transportation with other modes of travel.

ARCHITECTS' OFFICES
Pages 140–158

In his own office layout the architect designs and plans to please himself. What he thus evolves becomes for his clientele an example of his architectural ability—in effect, an advertisement. For suggestions in arrangement and equipment this portfolio has been prepared for architects who are revamping their offices or considering new quarters.

A PREVIEW
●
SEPTEMBER ISSUE



RESTAURANT IN LOS ANGELES, J. R. DAVIDSON, DESIGNER

TECHNICAL NEWS AND RESEARCH
●
RESTAURANTS
COFFEE SHOPS
CAFETERIAS

The subject of coffee and tea shops is highly specialized and technical. It is almost impossible to formulate rules for planning and designing restaurants. Every job is different—not superficially, but fundamentally—in that the patrons, the location, the size and shape, the type of eating place, and so forth, are all factors of utmost importance, and without consideration of which no scheme can be successful.

The first part of the article is therefore a general treatment of the problems confronting the architect, giving many helpful hints on subjects hitherto untouched. In the second part of the article the investigators outline as a summary the more technical requirements of the kitchen and equipment.

Feeling that it is the architect's duty to follow the trend of development in the types of buildings he designs, the writers have noted the recent popularity of the light lunch counter, sighting its disadvantages as well as its advantages. The restaurant service in the Pennsylvania Railroad Station in New York City is a striking example of what the public wants. The waiter-service restaurant on the south side is almost always empty while the counter service on the north, a few steps away, is always busy.

Supplementing this study will be a PORTFOLIO of illustrations of cafeterias and restaurants.

WHAT METALS TO USE?

What are stainless steel, Allegheny metal, duralumin, Monel metal, white metal, and all the other new building materials coming into increasing use? A comparative table of facts concerning these has been prepared by the Research Division of the Record for use by architects.

Bayley Prison Window. Super bar. Horizontal and vertical bars are continuous through ventilator opening. May be screened when desired.





Bayley Prison Window. Standard bar. Illustration shows pivoted ventilator opening screened.

New York City's House of Detention for Women, equipped throughout with Bayley Prison Windows Screened. Architect, Benjamin W. Levitan. Associate Architects, Sloan & Robertson. Contractors, Psaty and Fuhrman, New York.

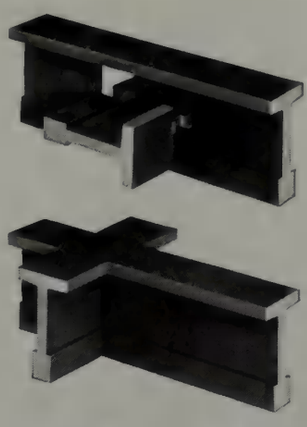


The Answer To a Pressing Need... Bayley Windows *for* Penal Institutions

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Cooperating with prison architects and prison officials, these windows have been designed to give an abundance of light and ventilation, and yet are as nearly escape-proof as modern steel construction can make them. They make outside bars unnecessary, and do away with the jail-like appearance of the buildings.

A nation-wide program of new prison building is under way. Prison board officials and architects interested in prison construction are invited to avail themselves of Bayley's helpful engineering cooperation—based on more than forty-nine years of practical experience. Your request for further information and illustrated literature will have prompt attention. The William Bayley Co., 132 North St., Springfield, Ohio.



This illustration shows Bayley Super Bar intersection. One-third actual size.

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OCCASIONALLY, in our travels, we come upon a home which seems to have been designed and built in complete accord with the setting nature has provided. One of these overlooks the ocean from the sandy slopes at Southampton, Long Island. Its lines are free from restraint—a quality which extends even to the material of which it is built.

Portland cement concrete was chosen because, of all durable and firesafe materials, it was most easily available. Also, it afforded the architect a versatile material with which to vary the wall treatments in harmony with the design. Whether the surface was to be curved or flat, rough or smooth, patterned or plain, colored or "natural", concrete was easily fashioned and tinted to the precise requirements.

The result is an exterior of unusual interest—rigid, durable walls that defy wind, weather and fire—and costs, both of building and maintenance, that are most attractively moderate. As a complete building material, concrete offers the home builder unlimited possibilities.



Exposed to the full force of ocean storms, these rigid, impenetrable walls of concrete are a constant safeguard against damage and consequent repair costs.

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33 WEST GRAND AVENUE
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A LEVIATHAN OF THE AIR

Under the wing of a giant Sikorsky twin-motored amphibian at the Long Island Aviation Country Club. This country club at Hicksville, N. Y., has its own clubhouse, hangar and flying field.



Photo. Ewing Galloway, N. Y.

THE ARCHITECTURAL RECORD

AN ILLUSTRATED MONTHLY MAGAZINE OF
ARCHITECTURE & THE ALLIED
ARTS & CRAFTS

VOLUME 68 AUGUST · 1930 NUMBER 2

TERMINALS?—TRANSFER!

BY RICHARD J. NEUTRA, ARCHITECT

Continuity must be considered the primary characteristic of traffic flow. Traffic consists in the movement of goods and persons. Changes of the vehicle are necessitated as the channel and speed of its flow are conditioned by geography and the density of interferences. But smooth continuity remains the principal requirement.

Traffic was once thought of as only *interurban*. A trip was *terminated* when the carriage arrived at its destination. The effort to reach a certain house or locality within that town was negligible. A modern community, in particular a metropolitan area, does not have a city wall or gate and it offers a difficult and specific traffic problem within because of its vast expansion. For the modern traveller, a long distance trip has to bring him not to an ultimate destination but to a link within a well arranged regional transportation system.

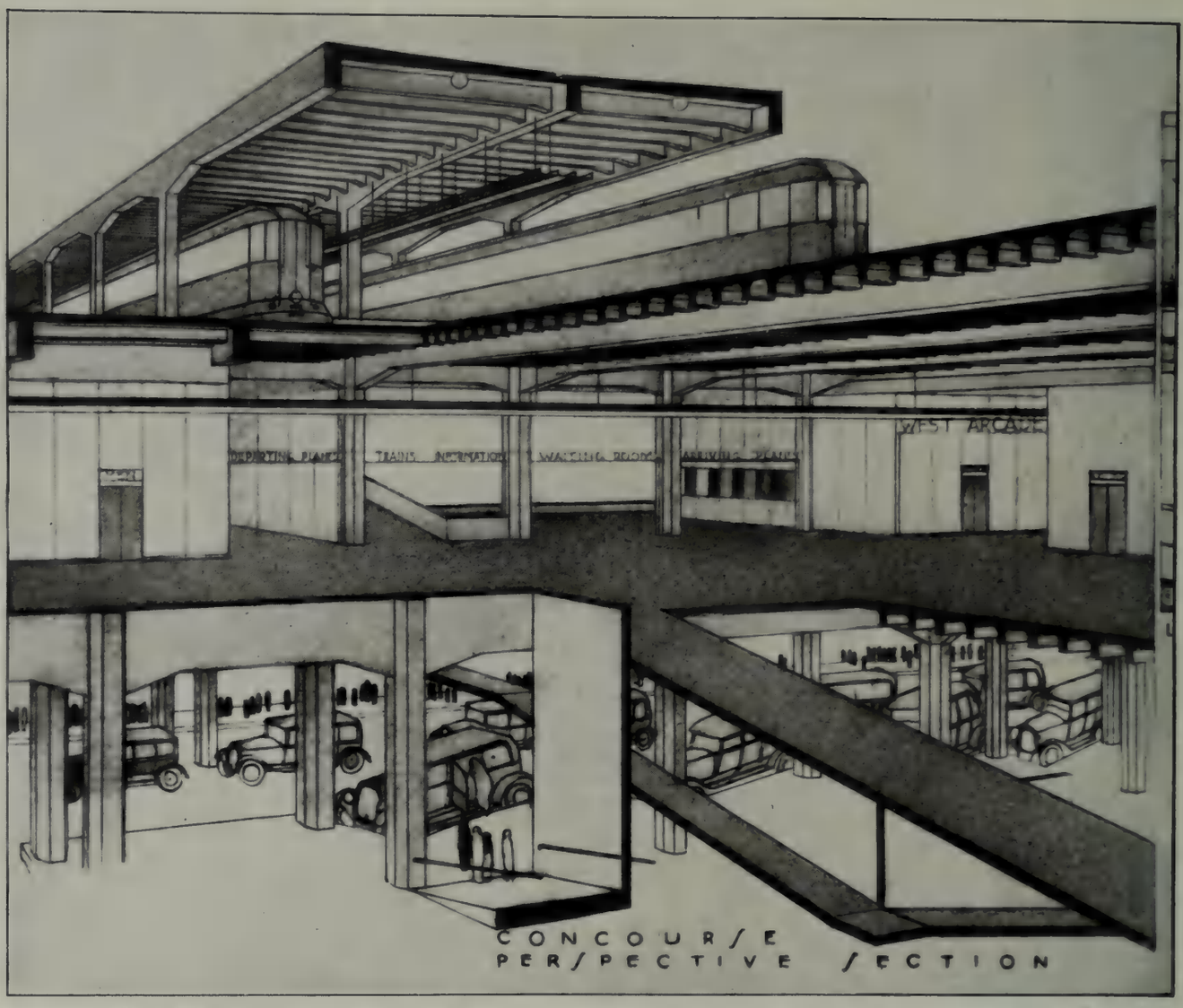
The idea of the nineteenth century was to recognize and acknowledge the railroad terminals as the new *city gates*. They accordingly were treated as architecture somewhat in the spirit of Sanmicheli. In the older capitals a plaza of representative character was also usually attempted in front of the depot, which made it pretty hard to articulate surface traffic lanes and frequently necessitated much walking and carrying of hand baggage from street car stops which were kept on the outside of this plaza.

The idea of the railroad depot as the new kind of a city gate, despite sacrificial money investments, proved a failure in Europe. It was a romantic transposition of an old concept into a set of new and hostile conditions. Very similarly one will find that in modern seaports the pier, the landing point of oceanliners, has not developed monumentally.

Terminals, representatively dressed up or plain, are altogether out of date.* The terminal idea is too much opposed to the necessary continuity of traffic flow. Through stations, junctions and beltlines are more adequate for the requirements of a modern region. The rapid transit and rolling surface traffic has to be brought side by side with the long distance tracks so that any monumental treatment crowded in between means only an undesirable obstacle.

With air transportation a new type of transfer point appears in the network of a regional traffic system: the so-called **airport.** Here similar mistakes are imminent and threatening early obsolescence of am-

* Neutra, *Wie Baut Amerika*. Jul. Hoffmann, Stuttgart. (pp. 7-12)



RUSH CITY AIR TRANSFER
Section through railway, grand concourse, and baggage room levels.

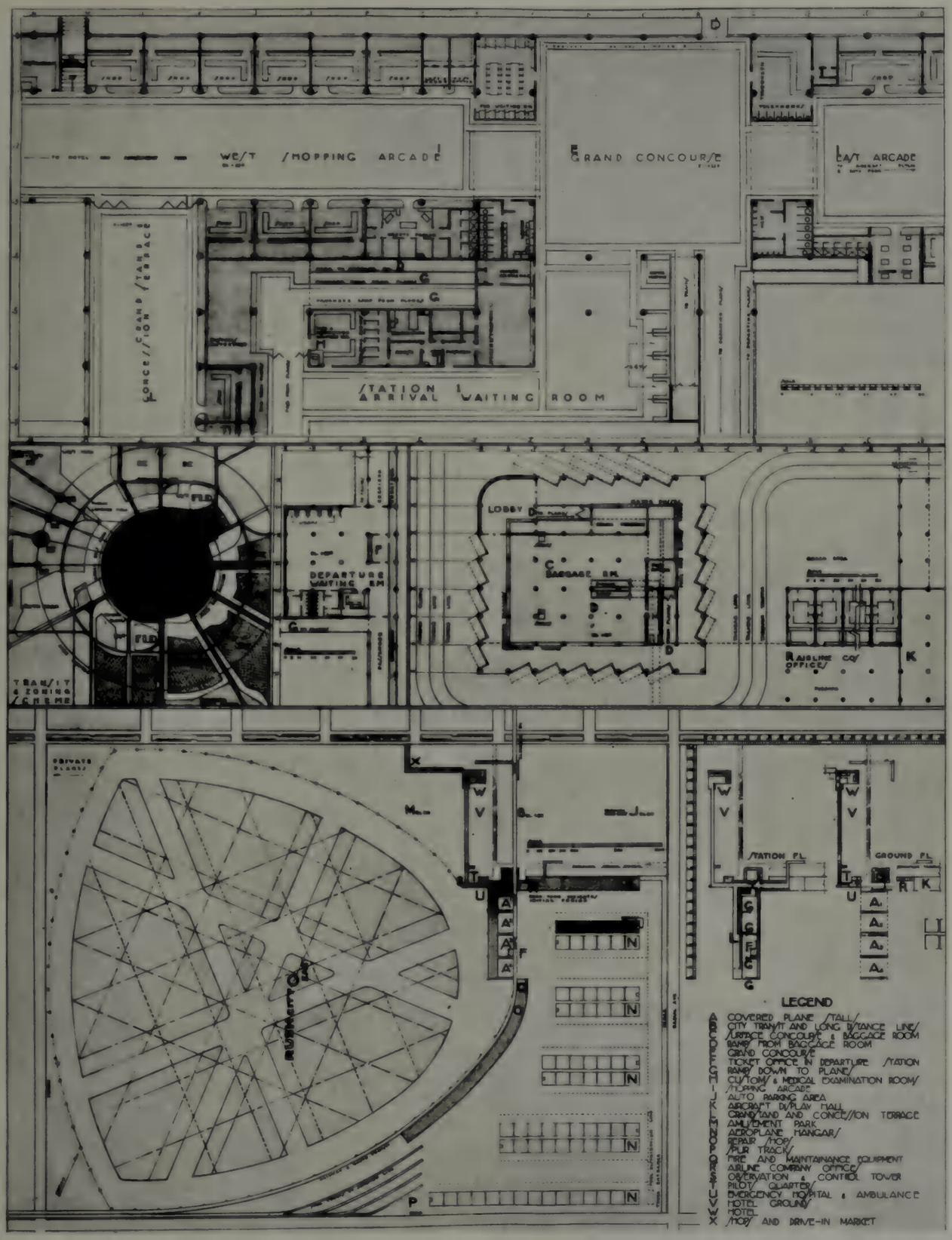
RICHARD J. NEUTRA, ARCHITECT, COLLABORATING WITH GREGORY AIN, DONALD GIFFEN, HARWELL H. HARRIS, AND RAGNHILDE LILJEDAHL

bitious investments as in the case of the railroad terminals.

At present an inefficient link between long distance air travel and regional traffic counterbalances the advantages of the former to quite an extent. Speed and fluidity in the transition from air to ground vehicle is what is needed more than a *grand court d'honneur* in front of an airport.

There is something static about the concept of a *port*. It seems to lack flexibility. What then is an airport? It should be a point where a specific kind of transportation stops. But freight and people go on being transported. They simply change their vehicle and this change should mean a minimum of time investment. It should be smooth, rapid and inexpensive. Not air-terminals and ports should be designed but rather through-stations and junction-points—*Air Transfers*.

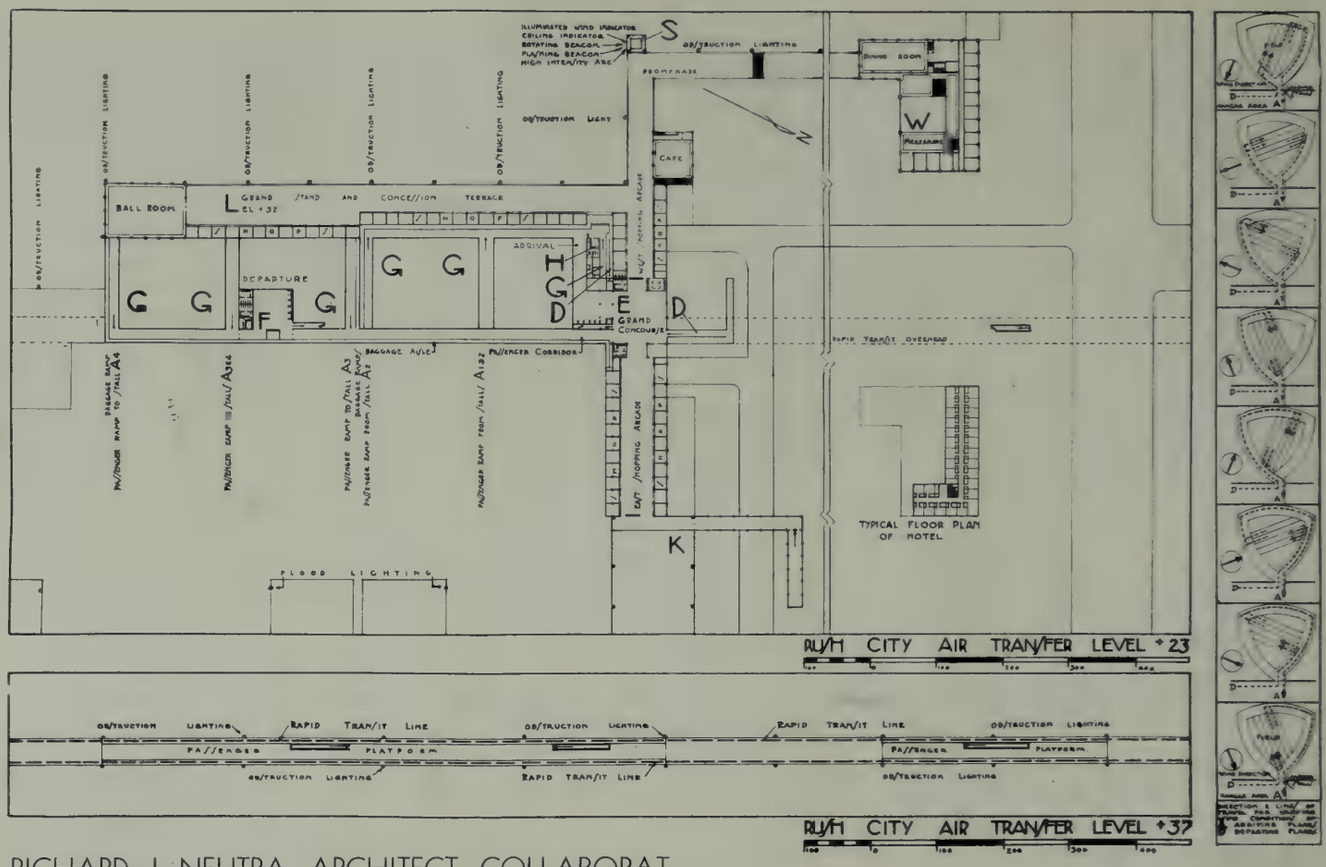
The project, *Rush City Air Transfer*, is founded entirely on the idea of seeing transportation as a whole and of providing for it as an interrelated whole. Certain primary and general assumptions seemed necessary. One was that because of land values a spacious air transfer would not be situated in the central part of the metropolitan area, but probably outside this zone, so that subway transit becomes a necessity. A desirable location would be within the green-



RUSH CITY AIR TRANSFER

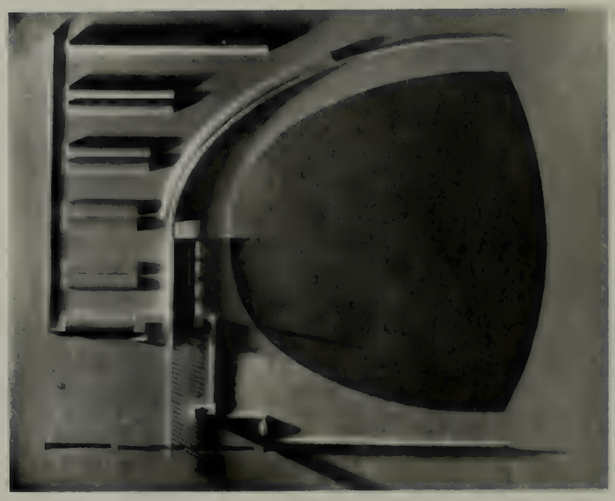
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RUSH CITY AIR TRANSFER
AIR VIEW OF MODEL



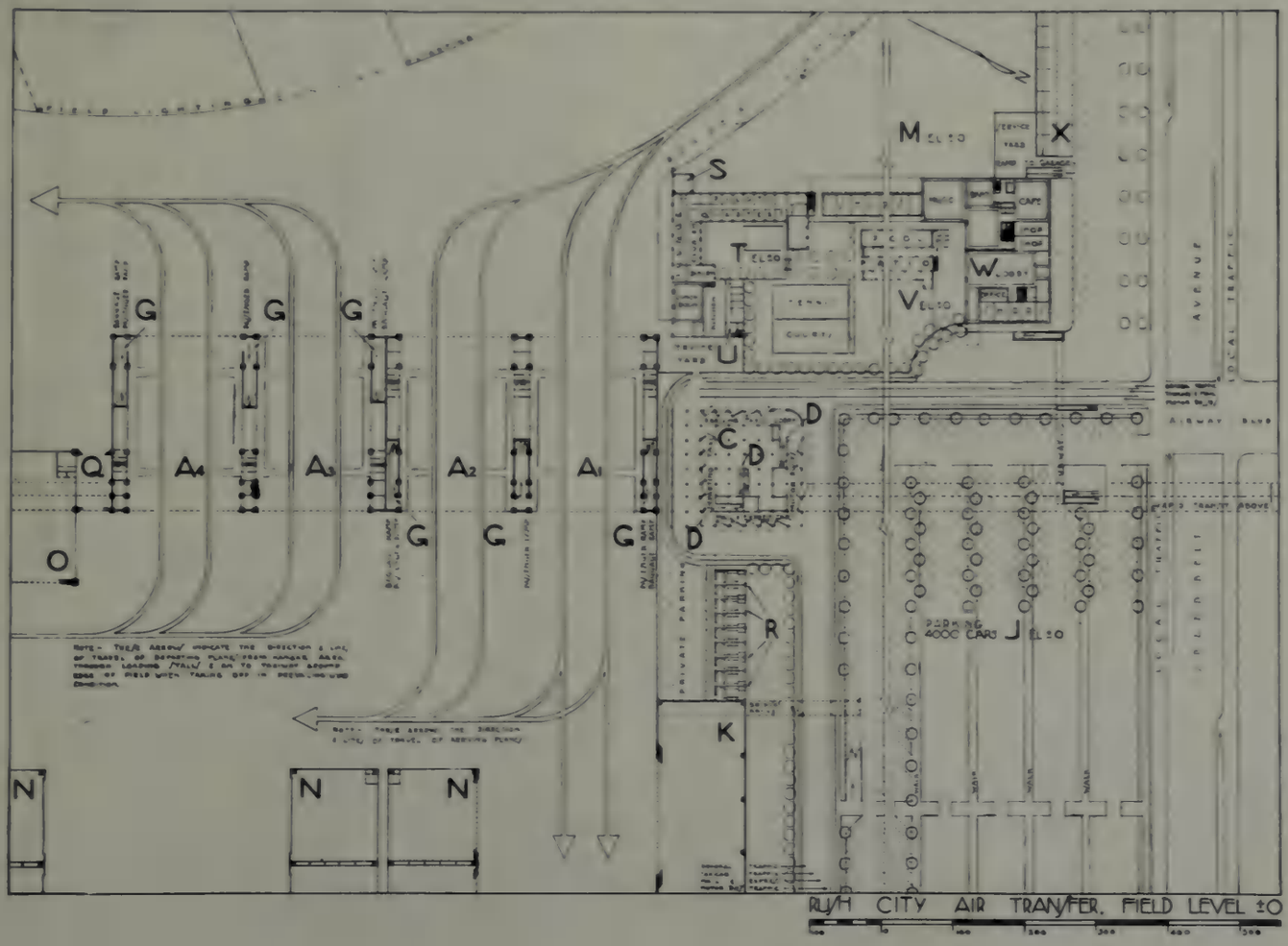
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RUSH CITY AIR TRANSFER
AIR VIEW OF MODEL

RICHARD J. NEUTRA, ARCHITECT, COLLABORATING WITH GREGORY AIN, DONALD GIFFEN, HARWELL H. HARRIS, AND RAGNHILDE LILJEDAHL



RUSH CITY AIR TRANSFER, FIELD LEVEL ±0

belt area surrounding the central core of the region zoned for business and central institutions.

The regional rapid transit is brought right over the spacious loading stalls of airliners, giving them at the same time a desirable protection during embarking and disembarking of passengers. Easy ramps connect the sidewalks of these stalls with main waiting rooms and the upstairs grand concourse as well as with the level of the metropolitan rapid transit traffic. On the other hand all tire vehicles enter the Air Transfer in traffic lanes especially assigned to the different types of conveyances: taxicabs, motor busses, baggage and mail trucks. They branch off Speedbelt Avenue and return to Radial Avenue. These vehicles stop at allotted places around their loading and unloading islands.

The main entrance lobby, with the baggage concourse, is centrally located around baggage elevators and ramps. From the lobby portion of this island easily ascended ramps lead passengers up to the grand concourse, lavatories, post office, writing and waiting rooms.

Thus this grand concourse twenty feet above the field level becomes the center of pedestrian traffic. It is therefore made the center from which revenue-bearing concessions radiate. Broad well-illuminated shopping arcades run in one direction toward the promenade overlooking the field, the cafe, the amusement park and the hotel, and in the other direction toward the aircraft display hall and the street bridge which connects this concession avenue with the spacious auto park.

Whereas the number and size of the concessions depend largely on the desirable attractiveness of the field in the eyes of the pleasure seeker, the number and size of the actual transfer facilities ought to be based upon the volume and character of the traffic handled and that in turn is in a functional proportion with *size and shape of the landing and take-off area*. If this area satisfies the U.S. Department of Commerce requirements by providing at least one runway 3500 feet long in each direction and if, for instance, a triarc shape after Gavin Hadden is assumed, then the ultimate capacity of the field in simultaneous landings and take-offs is four and its capacity for one hour, allowing seven and a half minutes for the single operation, is thirty-two.

If the average number of minutes required for loading and unloading is taken as fifteen, then to use the given field to capacity, eight simultaneous loading and unloading facilities must be provided for. The number and size of other facilities depend upon the number of passengers handled, which is found by multiplying the estimated number per plane by thirty-two. Thus, in a way, the length of runway determines the extent of all developments needed for the efficient operation of this given field. As a matter of course such development can take place in subsequent periods, when actual need arises and financial means can be supplied.

The arranging of the landing field on one side and the storage space of aircraft on the other of the double width loading stalls permits a definite and orderly routing of planes being taxied in or out. Centrally, in close reach from both sides, the fire and field maintenance department is located. The spur tracks of the electric junction railway branch into the hangar and repair yard where as many as 200 planes may be stored. By reinforced concrete vault construction the fire hazard is easily isolated in fireproof compartments and longer hangar units can be erected with safety and with saving of separating areas.

Briefly this is the case of *transfer* versus *terminal*. Certainly a stately forecourt, resembling perhaps that of Saint Peter's in Rome, would have undeniable monumental force and dignity, but it is doubtful if these qualities would be appreciated or desired by hurrying passengers who must pay for them with loss of time and energy and actual danger of injury from motor vehicles. Monumental design should be replaced by a more modest attitude until the problem in hand is practically well defined and solved.

AIRPORT AT HAMBURG GERMANY



Photos. Rheinländer



DYRSSEN AND AVERHOFF ARCHITECTS



Photo Rheinlander

AIRPORT AT HAMBURG, GERMANY
DYRSSEN AND AVERHOFF, ARCHITECTS

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.

DOUGLAS D. ELLINGTON, ARCHITECT



Photo Plateau Studios



FLOOR PLAN

The new First Baptist Church of Asheville is in actuality a group of five buildings which pyramid into a single structure.



Photo. Plateau Studios

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

The building was planned for a congregation of five thousand, which includes, in terms of seating capacity, educational provision for three thousand and church accommodation for two thousand.



Photo. Plateau Studios

There are more than one hundred rooms. The pastor's residence is the only detached structure.

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT



Photo. Plateau Studios

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

The exterior walls are of Booker brick which resembles the English handmade brick of the early eighteenth century.

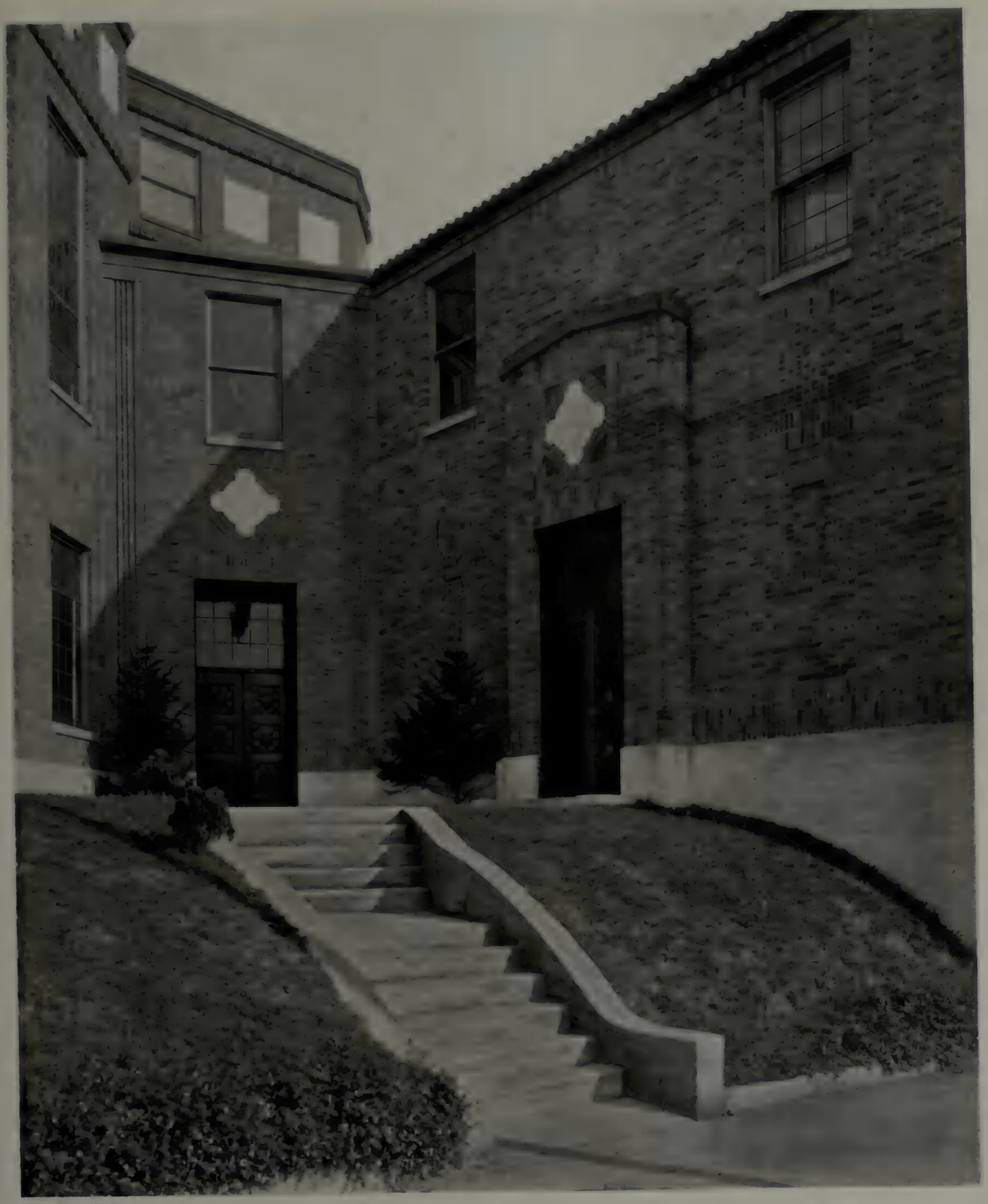


Photo. Plateau Studios

The profuse patterns occurring throughout the brickwork are set off at intervals by clearly delineated ornament in pink Georgia marble.

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

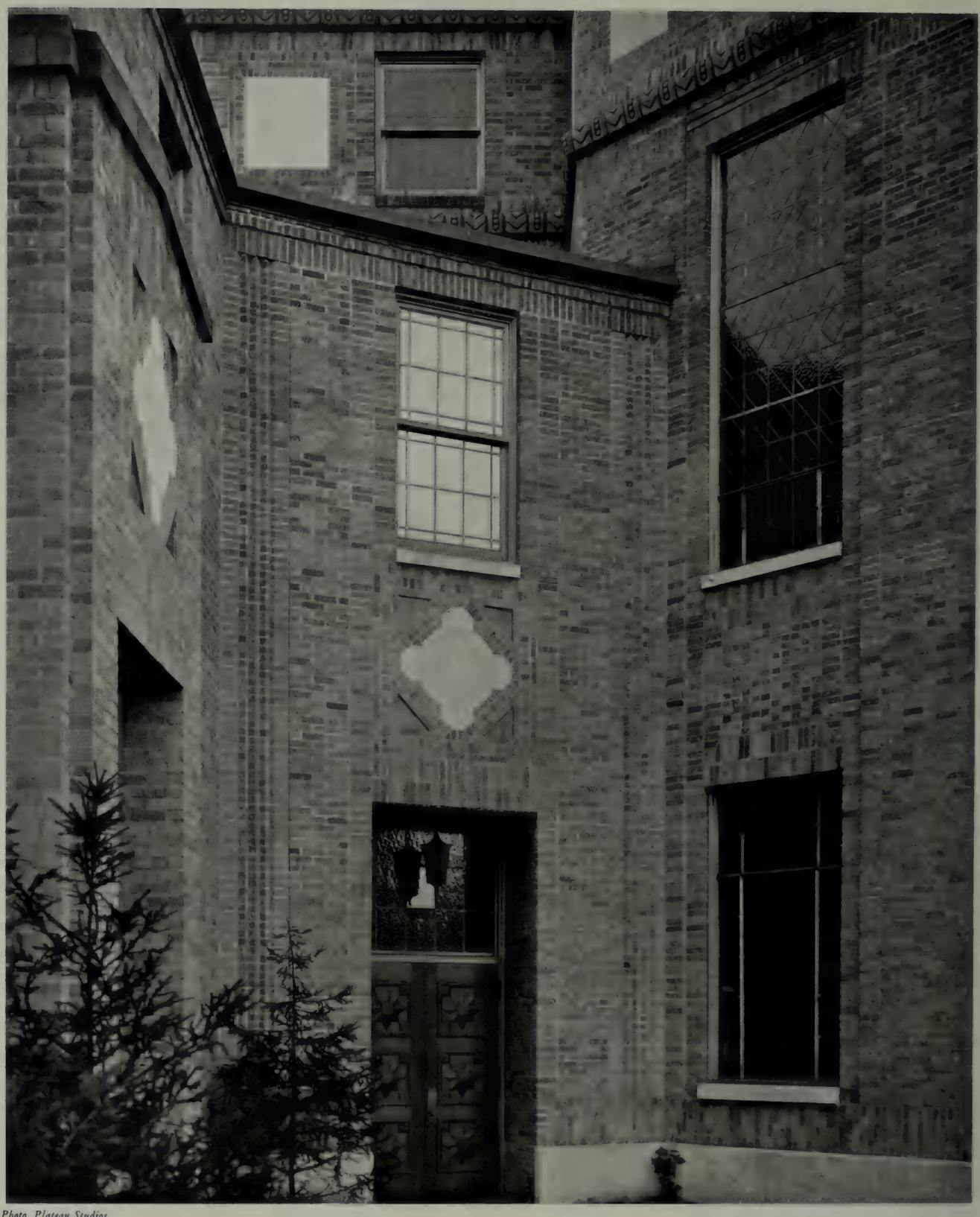


Photo. Plateau Studios

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

The brick color is a warm heather purple. The terra cotta bands and copings match the color of the brick. The general structure is of load-bearing brick construction.



Photo. Plateau Studios

The outer units of the educational areas are two stories in height, the inner units three stories in height, the main auditorium a height equal to five stories including the dome with which it is capped.

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT



Photo Plateau Studios

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

The tile roof, from eaves to apex, graduates in tone from a fire-flash purple through brown and red and ochre to green, finally blending into the rusty green of the copper cupola.



Photo Plateau Studios

The dome, self-contained within a steel frame, rests like an inverted bowl upon the octagonal walls of the auditorium. The balcony is of cantilevered steel construction.

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT



Photo. Plateau Studios

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

The general color employed in the interior is a warm green gray. In the walls, woodwork and furniture the quality of the color is light and in the floors and draperies it is of a deeper and duller hue.



Photo. Plateau Studios

The windows are of green and amber crinkled Flemish glass. The grilles and ornamental plaster are relieved in color with amber, gold and clear green.

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT



Photo. Plateau Studios

THE FIRST BAPTIST CHURCH OF ASHEVILLE, N. C.
DOUGLAS D. ELLINGTON, ARCHITECT

Cove lighting is used in the auditorium. All furnishings were designed by the architect. The cost of the structure was 35c a cubic foot.



Photo. J. W. Gillies, Inc.

HOUSE FOR J. C. DAVIES AT JOHNSTOWN, PA.

The only difficult problem presented was in laying out a building which would take its place on the top of a hill. The building cost was approximately 75c a cubic foot.

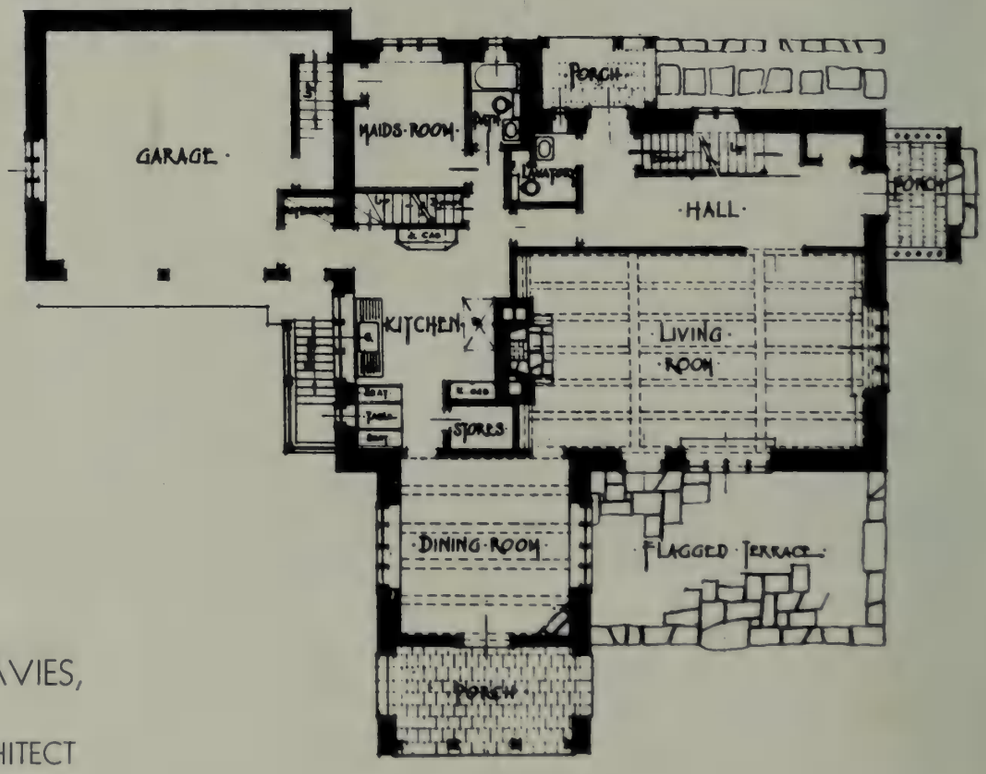
A COUNTRY HOUSE IN PENNSYLVANIA

FRANK J. FORSTER
ARCHITECT



Photo. J. W. Gillies Inc.

GROUND FLOOR PLAN

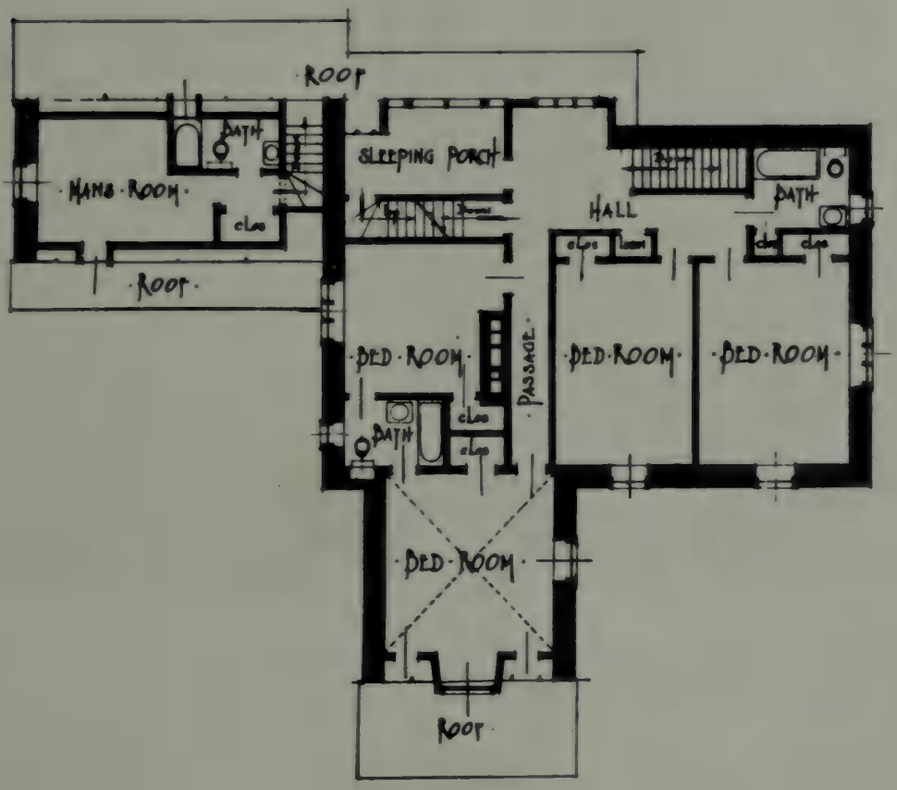


HOUSE FOR J. C. DAVIES, JOHNSTOWN, PA.
FRANK J. FORSTER, ARCHITECT



Photo. J. W. Gillies, Inc.

SECOND FLOOR PLAN



HOUSE FOR J. C. DAVIES,
JOHNSTOWN, PA.
FRANK J. FORSTER, ARCHITECT



Photo. J. W. Gillies, Inc.

HOUSE FOR J. C. DAVIES, JOHNSTOWN, PA.
FRANK J. FORSTER, ARCHITECT

The exterior woodwork has been stained in a soft weathered brown color. All of the timbering, both interior and exterior, was taken from an old barn.

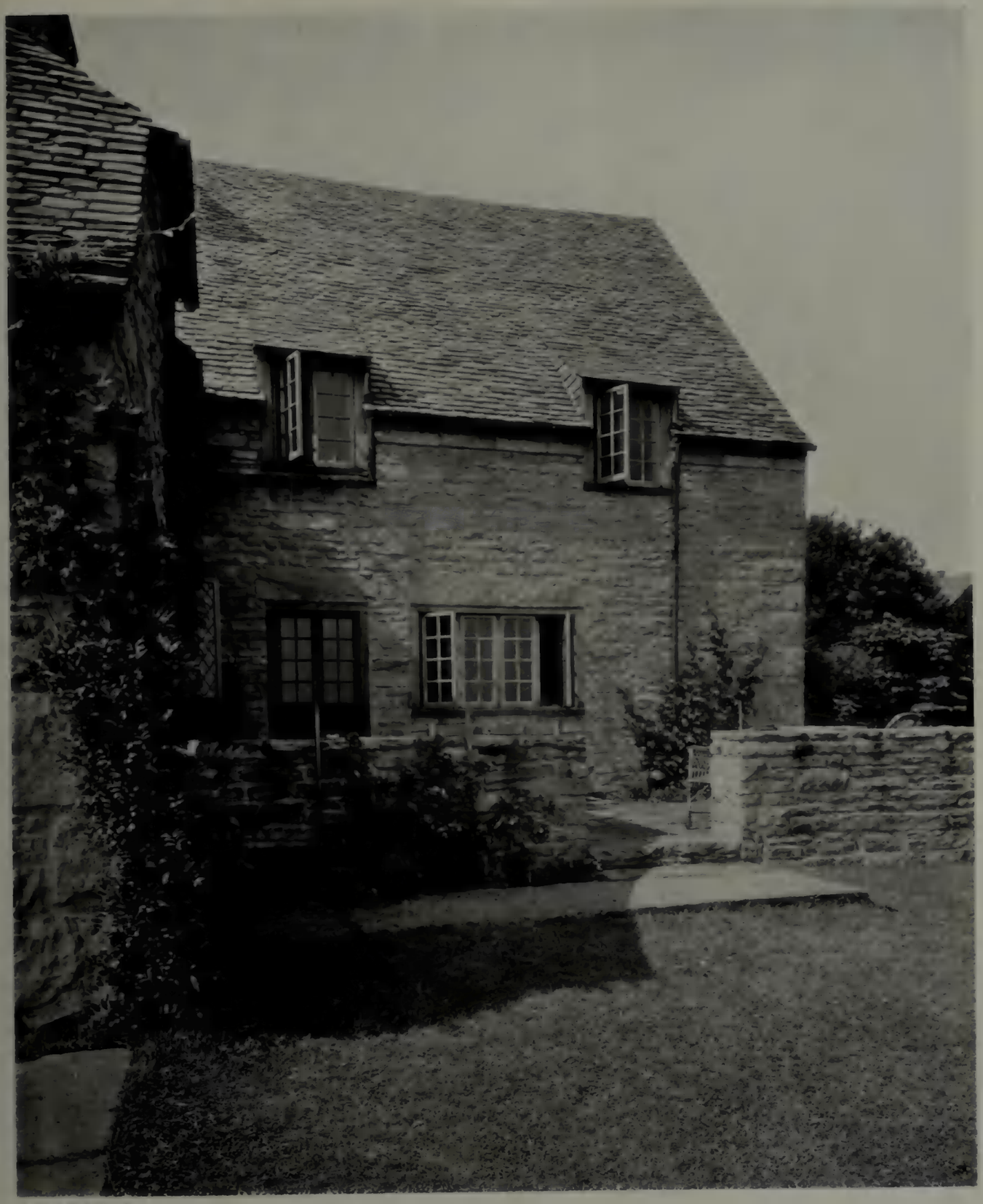


Photo. J. W. Gillies, Inc.

The stone for the exterior walls was taken from an old abandoned iron furnace located near Johnstown. Its color ranges from light buff to a soft plum color. The roof is a heavy slate, graduated in thickness and varying in color.

HOUSE FOR J. C. DAVIES, JOHNSTOWN, PA.

FRANK J. FORSTER, ARCHITECT



Photo. J. W. Gillies, Inc.

HOUSE FOR J. C. DAVIES, JOHNSTOWN, PA.
FRANK J. FORSTER, ARCHITECT

The interior woodwork of the first floor main rooms and second story hall is stained. The plaster is rough and slightly tinted. In the main bedrooms the plaster is also rough, but the woodwork is painted.

A COUNTRY HOUSE IN CALIFORNIA

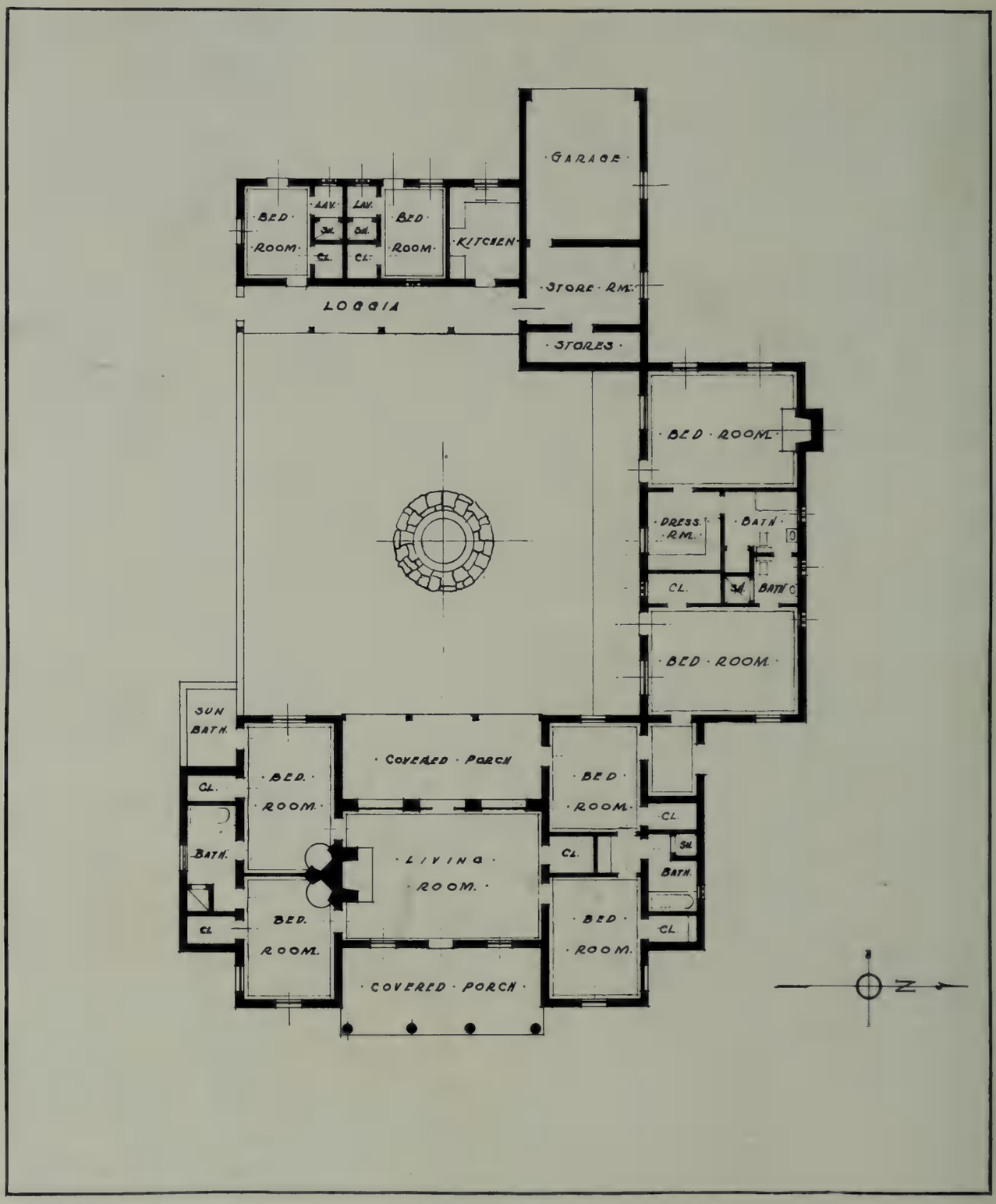




Photo. W. M. Clarke

HOUSE FOR CYRUS PIERCE,
LA QUINTA, CALIFORNIA

GORDON B. KAUFMANN
ARCHITECT



GROUND PLAN

HOUSE FOR CYRUS PIERCE, LA QUINTA, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



Photo. W. M. Clarke

HOUSE FOR CYRUS PIERCE, LA QUINTA, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



Photo. W. M. Clarke

HOUSE FOR CYRUS PIERCE, LA QUINTA, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



Photo, W. M. Clarke

HOUSE FOR CYRUS PIERCE, LA QUINTA, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT



Photo. W. M. Clarke

HOUSE FOR CYRUS PIERCE, LA QUINTA, CALIFORNIA
GORDON B. KAUFMANN, ARCHITECT

HOW SMALL A HOUSE?

The problem of providing lodgings for the small wage earners has attracted little study from architects. The task has been relegated to the ambitious but unskilled jerry-builder who has given us as his solution the haphazard ugliness of Shacktown and the Slum.

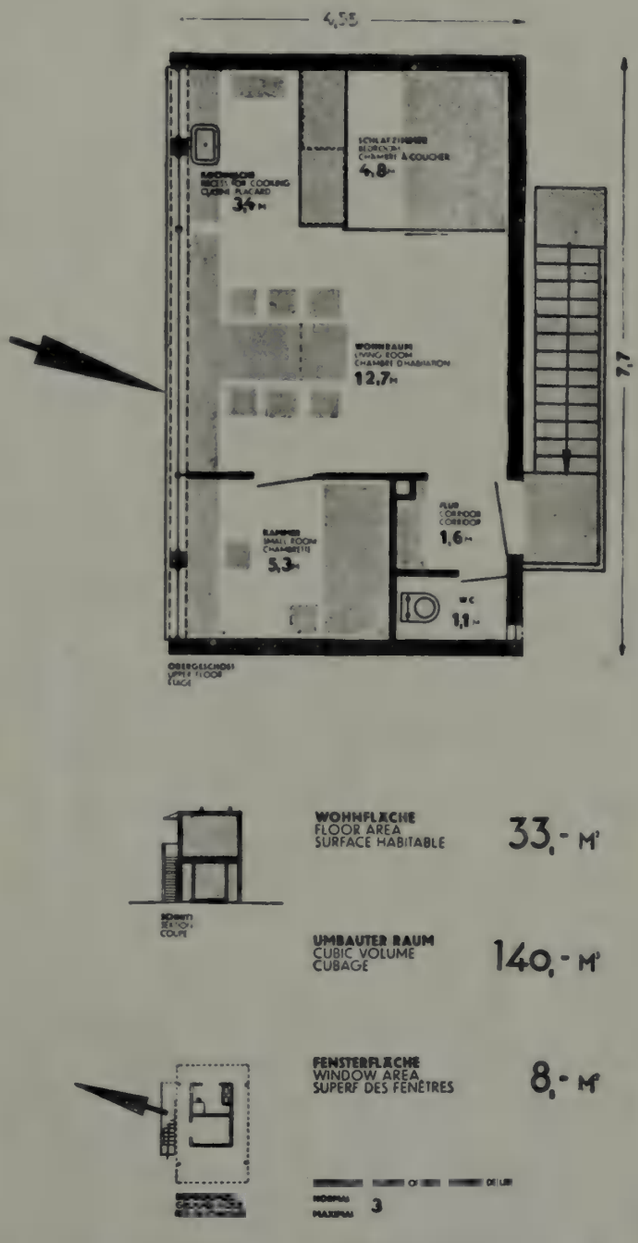
Obviously a change is necessary for the promotion of a healthy society and this change must evolve not through the hit and miss methods of speculative builders, but through the scientific study of the small habitation unit and the needs of the inhabitants. Something more than a mere contraction of rooms to their smallest livable dimensions is required. There should be included a maximum of the most up-to-date household conveniences, and new materials affording an economy of construction should be considered. Such a change from existing conditions presupposes a study not only of the demands of hygiene, but even of the structure and function of the family itself.

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The minimal habitation has already received attention in Europe where the problem of housing the masses efficiently and economically is pressing enough to be a political issue. At the second International Congress on Modern Architecture, held last year at Frankfurt-am-Main under the auspices of the *Stadtbauamt*, the minimal house was the sole subject of debate among the 150 delegates assembled from America and the various countries of Europe.

In conjunction with the Congress there was an exhibition of some hundred plans submitted by these architects as tentative solutions of the minimal house. These plans, drawn to a standardized scale, have since been collected and now appear in book form under the title, *Die Wohnung für das Existenzminimum*, published by Englert and Schlossen of Frankfurt. All descriptive captions are printed concurrently in German, English and French, and there is some text matter written by *Stadtbaurat* Ernst May of Frankfurt and by Dr. Siegfried Giedion of Zürich, secretary of the Congress and author of several books on modern architecture.

Some of the plans are quite interesting, offering a pertinent application to the plan-



A SPECIMEN ONE-FAMILY HOUSE FROM "DIE WOHNUNG FÜR DAS EXISTENZMINIMUM"

ning of apartment houses where space is at a premium. Others are quite mediocre, revealing no great planning craft other than that of reducing the essential rooms to their smallest allowable dimensions. The various tricks and *tours de force* are ingenious but unsatisfactory. The better plans are those inspired largely by the typical American "efficiency" apartment layouts where the same room serves a two-fold purpose, one by day and another by night. By far the most highly organized plan submitted is the one by Le Corbusier and P. Jeanneret, a scheme which is described in full detail in this issue of THE RECORD, pages 131–135.

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Realizing that it would not be possible to arrive at any definite conclusions within a few days on such a difficult problem as the minimal house, the Congress has sought instead to set up an international tribunal which will gather together material and data, recognize the sources of error and, above all, conduct investigations among business and professional men with the aim of substituting a scientific precision for vague subjective gropings in building construction. A collaboration between the professions on an international scale will be attempted to determine *scientifically* the program of the minimal habitation.

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Sociological requirements determine largely the minimal house, according to Prof. Walter Gropius of Berlin, who addressed the assembly. The economic life of the community has changed greatly: the cooperative division of labor has made the family lose its importance as an economic unit of production and consumption. The children become self-supporting at an early age and consequently the family tends to break up into separate entities always more reduced in size and more numerous. This phenomenon is not an evidence of decadence; rather it is an intermediate stage towards a more differentiated society.

For the habitation all this means a steadily increasing number of separate, distinct lodgings, and at the same time a reduction in their dimensions. These minimized dimensions which are brought about by the decentralization of the family should not be considered simply as the result of a transitory economic development—they relate intrinsically to the division of labor, which in turn has been brought about by the development of modern industry.

The change in social conditions requires the elaboration of an entirely new program for the minimal habitation. It is not by merely reducing the dimensions of houses already evolved that one can find the solution. First it is necessary to determine the minimum of air, light and space which each person requires. Biologists and hygienists demand a maximum of light and air, but within a space reduced sufficiently to render this maximum possible. Certain rules can then be set forth—to enlarge the windows, to economize the habitable space and to give each adult his own room.

Architects have no interest in going below the minimum requirements of hygiene for reasons of economy. They are able to recognize clearly their responsibilities as professional men in the problems of building. Consequently they should demand a change in the spirit of building codes—rigid laws should be replaced by those more flexible. Bad housing, however, will be eliminated by the initiative of the inhabitant himself (acting through cooperative societies) and by the qualified architect rather than by laws. It is for the producer and the consumer to fix the conditions of the habitation.

Experience shows that in all countries, because of the disproportion between incomes and the costs of construction, there can be no satisfactory way of housing the working classes under present conditions. Building operations stay within the limits of industry and finance, and any initial savings in cost of construction accrue to the benefit of the private capital invested. For this reason the construction of more economical housing should be encouraged by the government.

C. THEODORE LARSON



THE MINIMAL HOUSE: A SOLUTION

By LE CORBUSIER and P. JEANNERET, ARCHITECTS

THE PROBLEM

The design of a dwelling that will be hygienic, weathertight and of sound construction, offering a high standard of living within the workingman's income.

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THE SOLUTION—IN PRINCIPLE

Americans are quite familiar with the one-room "efficiency" apartment, made possible by the invention of the folding bed. Its efficiency lies in the fact that one room is used for two purposes: as a living room by day, as a bedroom by night. During the day a bedroom is used but little, if at all; by night the living room remains empty. The combination of the two functions in the same room is a logical development. This principle is the logic of the minimal house. Instead of attempting to find the absolute minima for a living room, a bedroom and a kitchen, and then combining these into a more or less well-articulated plan, the problem has been approached from the viewpoint that wherever it is rational and logical the same space shall be used to serve more than one function.

The result is a great economy of surface and cubage. The actual area inside the exterior walls is 529 square feet and serves a family of six; the owner pays for 529 square feet of floor area although practically the area is much greater. The house is a true "dwelling machine"—there is no lost space.

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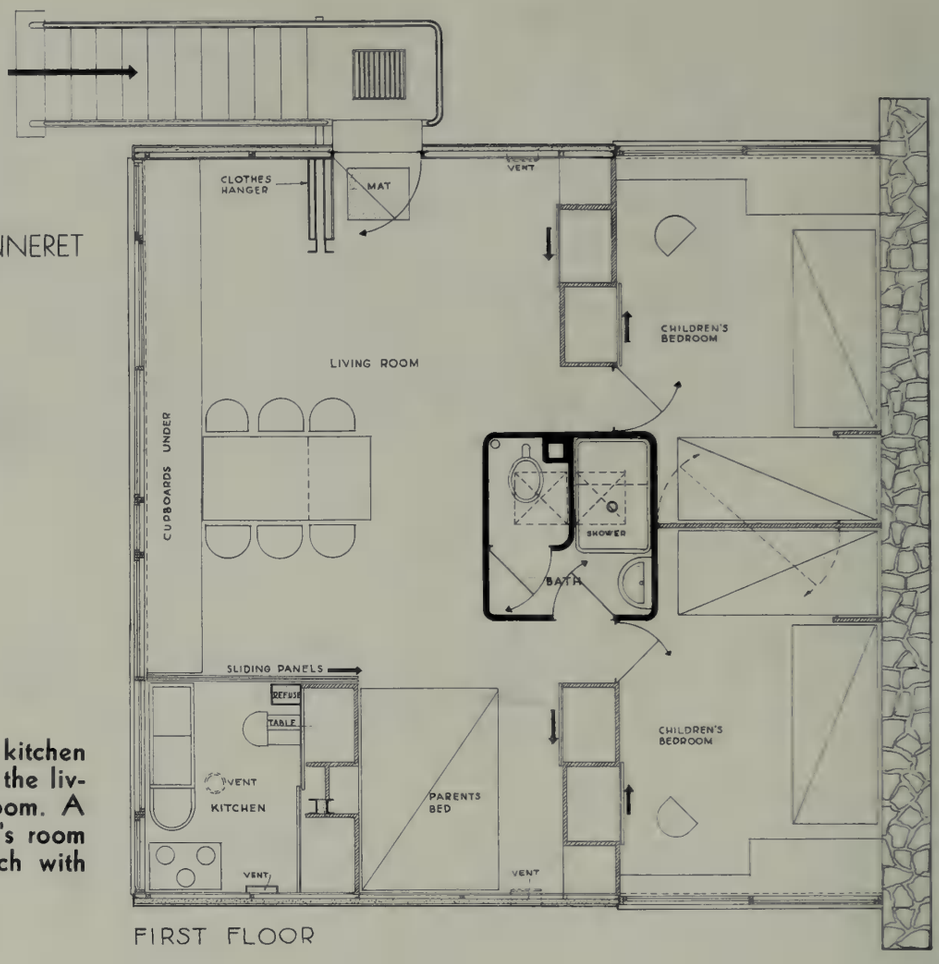
THE SOLUTION—IN DETAIL

The house is the semi-detached type. The actual living quarters are raised one story off the ground and form a unit which is surrounded by the atmosphere on all sides, top and bottom. The house is in the air, with no damp cellar, and with the garden passing underneath. The small portion on the ground level contains only the laundry and heater room, a store room and the refuse box.

In the interior the only fixed partitions are those around the bathroom. The other partitions either are light-weight sliding panels or comprise standard closets and cupboards. These are constructed of sheet metal and have sliding doors. Inside there is shelving for the storing of clothing. The dimensions are standardized but allow many combinations. This idea of built-in furniture is also carried out in the tables at each window of the children's room.

A MINIMAL HOUSE

LE CORBUSIER AND P. JEANNERET
ARCHITECTS



FIRST FLOOR

BY NIGHT

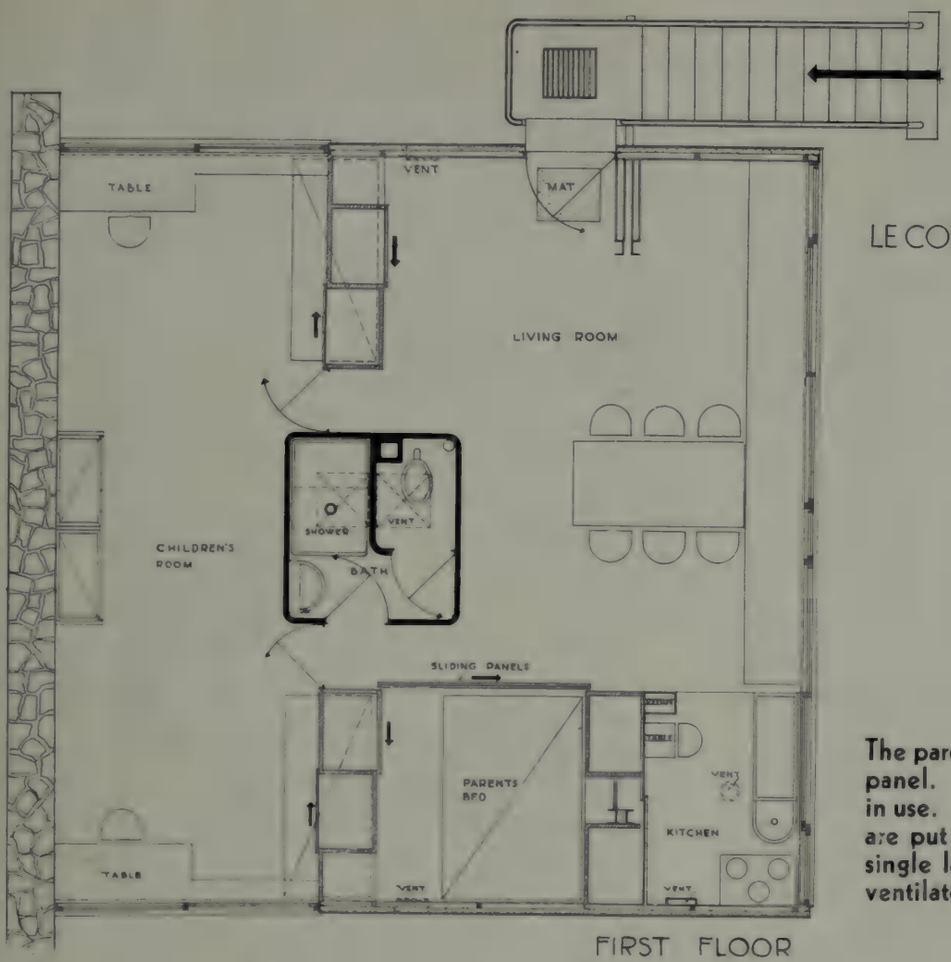
A sliding panel shuts off the kitchen and allows the parents to use the living room as part of the bedroom. A partition divides the children's room into two separate rooms, each with two beds

The plan reproduced shows the house by day and by night. In the daytime, by means of a sliding panel, the parents' bed is closed from the living room, thus shutting off a small space which could not be utilized. The kitchen, when not in use, may also be closed by means of another sliding panel. In the children's room two beds are of the folding type, and during the day they are folded into the closets. The two other beds are pushed halfway under the closet partitions which separate this room from the remainder of the suite. Thus the parents have a quiet living room to themselves where they may be alone, which is a desirable feature. The children have a large playroom and study is well ventilated and lighted.

At night the two panels are pushed over to shut off the kitchen, and the parents have a large and airy bedroom of which the living room is now a part. In the children's room, the wood front wall of the bed closet is pulled forward on a track until it is halfway between the closet and the bathroom wall, then it is turned on a pivot: this forms a partition dividing the room into two smaller rooms. The folding beds are then lowered, and the other two beds pulled out and placed in convenient positions. If there are boys and girls in the family, the two bedrooms are desirable.

The kitchen is simply equipped: a sink, a range, and a workboard that slides out from the built-in cupboard to be used for the preparation of food. In the floor is the lid of the flue leading to the refuse box. The living room is utilized as a dining room.

The bathroom contains a water closet and a lavatory. The bathtub is the type in which one sits rather than lies down; the shower is overhead. A skylight lights this room.



FIRST FLOOR

A MINIMAL HOUSE

LE CORBUSIER AND P. JEANNERET
ARCHITECTS

BY DAY

The parents' bed is shut off by a sliding panel. Likewise the kitchen when not in use. In the children's room the beds are put away and the children have a single large playroom and study, well ventilated and lighted

VENTILATION

In addition to the windows there is an auxiliary system of ventilating grilles. In the bathroom, the outside air enters from beneath the house through a grille in the floor and then passes out through grilles at the side of the skylight. In the kitchen there is a wall grille at the floor and an adjustable ventilator in the ceiling. In the living room one wall grille is placed near the parents' bed and another at the corresponding position on the opposite wall. This auxiliary system assures a constant circulation of fresh air.

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WINDOWS

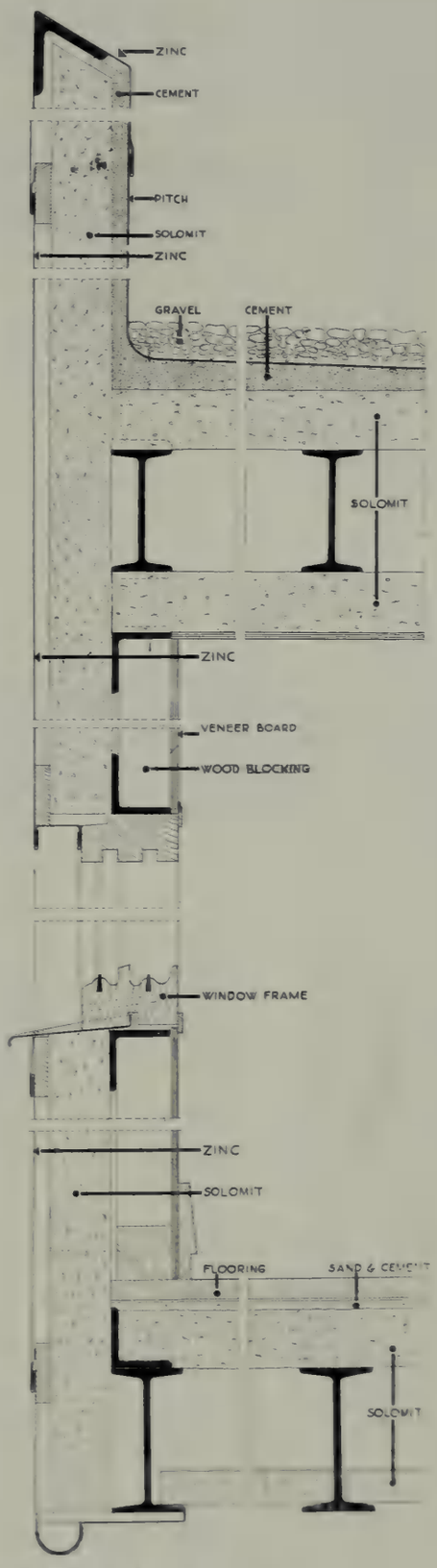
The windows take a form which evolves from the construction. The exterior walls are not supporting and are free of the columns which support the house, giving what is called a "free facade". This fact allows the windows to be a continuous horizontal band of glass stretching from wall to wall or, if necessary, all around the house. In Europe the customary type of window is the casement which, when opened, encumbers more or less the interior. The windows of this house are the sliding type, standard units 8′-3″ in length, each unit containing two sliding sashes.

The window openings are contiguous to the lateral walls so that the walls act as strong reflectors for the light and aid in carrying it farther into the room. Experiments with buildings already constructed have demonstrated that windows contiguous to the walls give a light to the interior of the room that is stronger and more uniform in quality than that given by a number of isolated windows. The larger area of glass also allows more light.

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CONSTRUCTION

In working out the construction the factor of economy was the determinant.



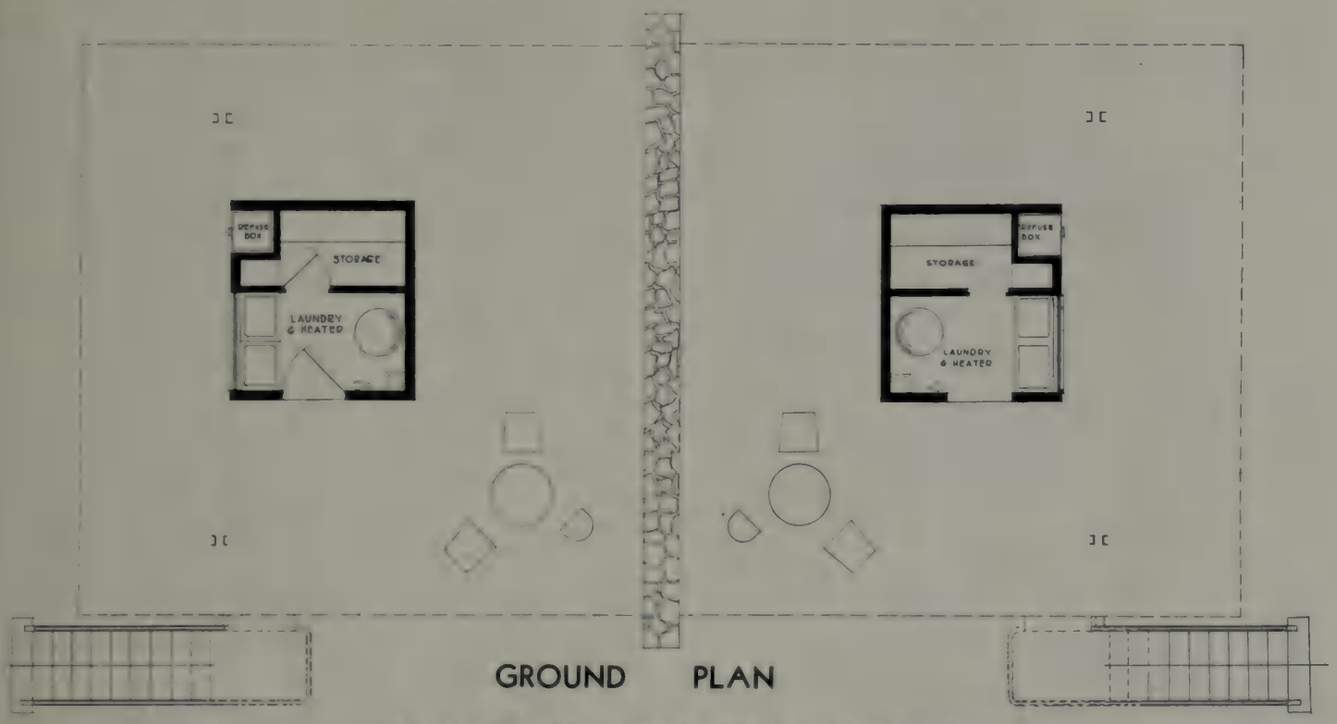
CONSTRUCTION DETAIL
A MINIMAL HOUSE
LE CORBUSIER AND P. JEANNERET
ARCHITECTS

Cheap materials and cheap construction are not rational solutions of the problem. Materials and methods should be the best. The real solution lies in industrializing them, in designing a construction that will allow the greater portion of the work to be accomplished in the factory, thus reducing to a minimum the work done on the site. Steel was selected for the main structural members. For each house there are two columns formed by coupled channels, placed well within the line of the exterior walls. At the same level and against the party walls are channels. The steel floor beams rest on the channel at one end. Between these channels, at floor and roof levels, are I-girder beams, cantilevered out to the exterior walls. At the same levels and against the party walls are channels. The steel floor beams rest on the channel at one end and are cantilevered out beyond the I-girder beam at the other. The structure of the exterior wall is a light cagework of 2″ angles.

Since the walls are no longer supporting, their only function is to be impermeable against the weather and to act as insulation against temperature changes. Other than masonry, which has the defects of excessive weight and great labor cost, there is no single material (as yet developed) which combines adequately the two properties of impermeability and insulation. It was decided therefore to use two materials, each of which would possess one of these qualities. For the insulation, a 2″ thickness of *Solomit* was selected: this is placed on the outer face of the steel angles and fastened to wood blocking. To protect the *Solomit* against fracture and to make an impermeable surface, plates of sheet zinc are laid on the exterior, with wood stripping between the *Solomit* and the zinc.

The interior finish is painted veneer board. The result is a wall that is light in weight, thin in section, and easily constructed, with better insulating and impermeability qualities than masonry.

The floors and roof are similar in construction, except that the roof is finished



GROUND PLAN

A TWO-FAMILY MINIMAL HOUSE
LE CORBUSIER AND P. JEANNERET, ARCHITECTS

with layers of cement and an asphalt compound applied on top of the *Solomit*.

The exterior stair is of light weight steel construction. The horses and railing are steel tubing; the treads and landing, steel plates. The entire stair is assembled at the factory and mounted in place simply by bolting or riveting it to the first step which is of concrete.

The great advantage of this system is the ease of construction. In the first place most of the labor can be performed at the factory. Secondly, the house is not "built": in reality, the different elements are *mounted* into place. The construction proceeds quickly and cleanly for little, if any, water is needed. Dry construction is the most rapid and the most economical. Thirdly, the various elements of the house can be fabricated at the factory and shipped to any part of the country, ready to be assembled.

The only masonry used in the building is the small construction on the ground level and the party wall. The intrusion of this masonry party wall is quite curious, for there is no essential structural reason for its existence. It is merely a necessary and temporary concession to the local stonemasons, giving them some work.

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PURPOSE AND COST

This house was first developed to satisfy the Loucheur Law, under which the French government will offer loans to prospective builders and home owners in addition to the loans the banks will give.

The house was designed for the least expensive class of workmen's dwellings under this law.

The cost, including all equipment, plumbing, heating, folding beds, closets and the like, is estimated at 39,000 francs ($1,560), provided that at least a hundred houses are constructed at one time. If produced in greater quantities, this cost will be even less. NORMAN N. RICE



HERBERT CROLY, 1869-1930
EDITOR OF THE ARCHITECTURAL RECORD, 1900-1906

It is difficult to analyze the traits of a friend, a process that requires a cool detachment. When I think of Herbert Croly, affection fills my thoughts, and to try to recall his architectural interests is to recall, first and last, our frequent conversations in which professional ideas, if I may so describe them, were lost in the extraordinarily wide vision of the man. But from these very conversations and his writings in The Architectural Record twenty-odd years ago, there comes back to me one vivid memory which helps me, as an architect, to pay tribute to his name. It is of his remarkable solidarity with the art we so often discussed, the insight, so unusual in the layman, to look at architecture from the architect's point of view.

An architectural theme was not, for him, merely an episode in the day's work. He cared for the subject, was keen upon its right development in this country and sensitive to all its aspects. He looked deeply into these, too. "It is the idea in a work of art that is striven after," was one of his convictions, and it was this feeling of his for the true, organic meaning of architecture that made him a useful interpreter of it. He had a way of making himself thoroughly familiar with the various categories in this art, and could write with equal effectiveness about city or country houses, clubs and all sorts of public buildings, not excluding theaters. It was of a badly designed theater that I remember his writing. "It belongs to the numerous group of the American architectural hybrid." That remark was characteristic of Herbert Croly in its forthright expression of disapproval. He was often a caustic critic. But I know that what gave him the highest pleasure was writing of good work.

He had ceased to contribute regularly articles on architecture when the skyscraper and the various exigencies of the zoning laws were producing their astonishing effect on the aspect of the modern city. These things I know excited him and he was filled with the hope that some great good to architecture would come of these economic necessities.

My concern at the present time, however, is as to his writings at earlier times. Then he wrote generously, and understandingly and with a clear recognition of historic standards. In the domain of sociology he was a progressive, as we all know. . . . Addressing an audience that embraced the professional and the layman, he appealed to both in favor of good taste. Writing at a period in which American architecture was being transformed he held fast to tried principles and urged discrimination. I come to think of my old friend as having made a most valuable contribution to the highest ideals of architecture.

Charles A. Platt

(Reprinted by courtesy of the *New Republic*, of which Mr. Croly had been editor since its foundation in 1914.)

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ARCHITECTURE

GARNER, THOMAS AND ARTHUR STRATTON

The domestic architecture of England during the Tudor period, illustrated in a series of photographs and measured drawings of country houses and other buildings; with historical and descriptive text. 2nd edition. New York: Charles Scribner's Sons, 1929. 2 vols. Front., illus., plates. f°. $65.00. 724.12.

English edition published by Batsford, in London. First edition, 1910.

This second edition has smaller format, an addition of some twenty houses and a "rearrangement of subjects into groups determined by the dominant material used in their construction." Thoroughly indexed.

HUSSEY, CHRISTOPHER

The old homes of Britain: the southern counties; Kent, Sussex, Hampshire, Surrey and Middlesex. London: Country Life, 1928. 80 p. 80 illus., map. f°. 5s. 728.

Short discussion of the general characteristics of English domestic architecture from the period of the castle to that of Adam. Then follow notes on each house illustrated. The plates are large size and clear.

SMALL, TUNSTALL, & C. WOODBRIDGE

Mouldings of the Wren and Georgian periods; a portfolio of full size sections. London: The Architectural Press, 1928. xv p. 20 plates. f° 8s. 6d. 729.3.

"In compiling this portfolio of full size sections of unenriched Wren and Georgian mouldings, we have made a general selection of authentic contours taken from good domestic work of these periods."—Preface.

Shows panel moulds, handrails, architraves, cornices, with their measurements and source.

SVENSEN, CARL LARS, AND E. G. SHELTON

Architectural drafting. New York: Van Nostrand Co., Inc., 1929. ix, 206. p. Illus., plans. 8°. $2.00. 744.

A text book which deals with architectural details, constructions, plan drawings and the applications of architectural drafting.

TERRASSE, CHARLES

Médersas du Maroc. Paris: Albert Morancé, 1928. 35 p. Illus., 70 plates. 4°. 150 fr. 720.96.

Essay on the architectural features of the Médersa, a Mohammedan college attached to the mosque, where students are lodged. Includes a detailed description of each Médersa. The seventy plates are photographs of exteriors, interiors and details of decoration.

ALLIED ARTS

GEERLINGS, GERALD KENNETH

Metal crafts in architecture, bronze, brass, cast iron, copper, lead, current developments, tin, lighting fixtures, specifications. New York: Charles Scribner's Sons, 1929. vi, 202 p. Front., illus. f°. $7.50. 721.

Bibliography, p. 199.

A discussion of the history, craftsmanship, usage and design of various metals as used in architecture. The plates show both historic and modern examples, and are well-indexed.

SIMONS, WILLIAM L.

Furniture for today, and tomorrow, with details, scale drawings and pen and ink sketches. New York Architectural Book Pub. Co., 1928. 80 plates. $10.00. 729.

A series of eighty measured drawings illustrating furniture and its detail. No text.

SOCIÉTÉ DES ARTISTES DÉCORATEURS, PARIS

Intérieurs au Salon des artistes décorateurs, Paris, 1928, présentés par Réné Prou. Paris: Charles Moreau, 1928. 8 p. 48 plates. f°. 100 fr. 747.

Forty-eight plates, of which six are in color, illustrate contemporary domestic and a few office interiors. These examples suggest a tendency toward an increasing complexity of design.

STUTTMAN, FERDINAND

Deutsche Schmiedeeisenkunst. Band V: Gegenwart. München: Delphin-Verlag, 1928. 20 p. Illus., 56 plates. f°. 45 marks. 721.

Examples of recent German wrought iron, both ecclesiastical and domestic, with illustrations of screens, doors, gates, stair-rails, fireplace accessories and lighting fixtures. Volumes 1 and 2 of this title, published in 1927, show the work of the Middle Ages and of the Renaissance and early Baroque periods.

VERNEUIL, MAURICE PILLARD

Carl Milles, sculpteur suédois: suivi de deux études: Bildhauer Carl Milles par Walther Unus: the art of Carl Milles par Charles Marriott. Paris: Van Oest, 1929. 2 vols. Illus. 128 plates. 500 fr. 735.

A detailed study and appreciation of the work of this contemporary Swedish sculptor. The second volume is a collection of excellent plates.

VIRETTE, JEAN

Intérieurs modernes et rustiques. Paris: Alexis Sinjon, 1928. 4 p. 56 plates. f°. 120 fr. 747.

Current work of twenty contemporary French architects, illustrating the decoration of ships and the interiors of both town and country homes.



DOOR TO PRIVATE OFFICE

Chromium metal and sand-blasted glass . . . Lighting is obtained by three ceiling fixtures, composed of four tubular lamps each, and three panels of glass of various sizes placed close enough to the ceiling to prevent their being seen from any part of the room . . . The large curtain provides privacy when the door is open as well as absorbing sound vibration.

PORTFOLIO OF CURRENT ARCHITECTURE

FEATURING ARCHITECTS' OFFICES •



VIEW OF ANTE-ROOM
Draperies are silver satin, hung double . . . Walls are azure blue fabricoid . . . Ceiling is a Swiss silver tekko paper . . . On the floor is a black carpet on ½″ lining.

OFFICE OF
BOWMAN BROTHERS, ARCHITECTS
CHICAGO, ILL.



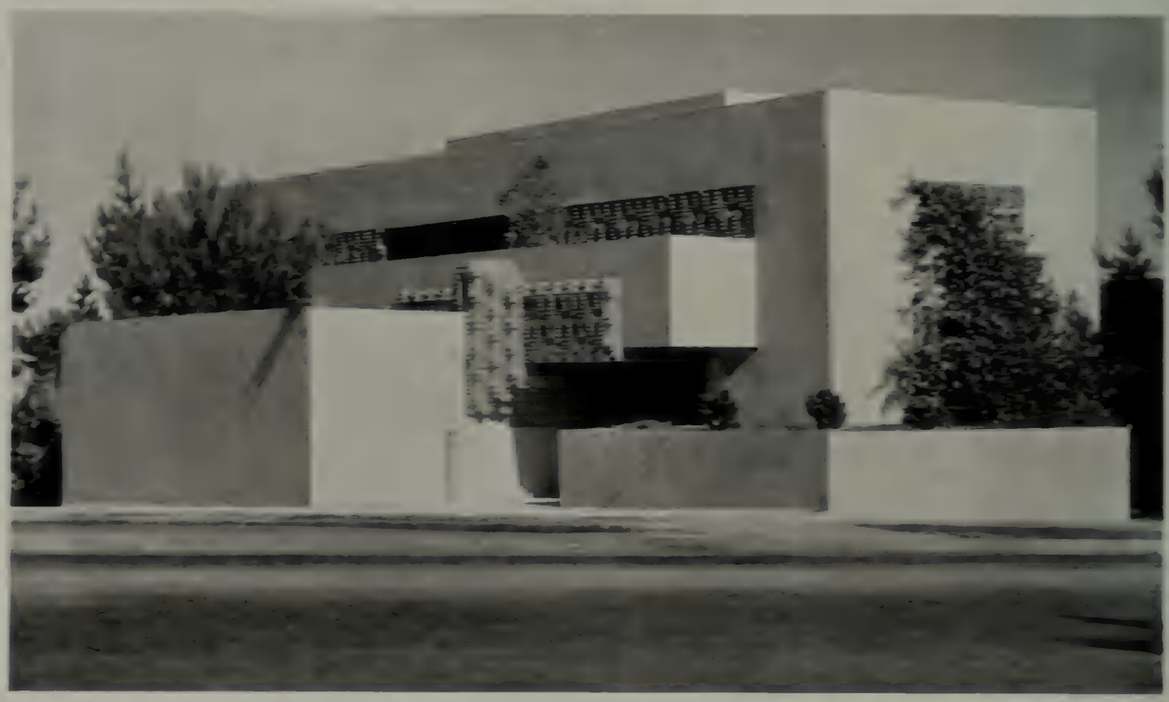
OFFICE OF
BOWMAN BROTHERS, ARCHITECTS
CHICAGO, ILL.

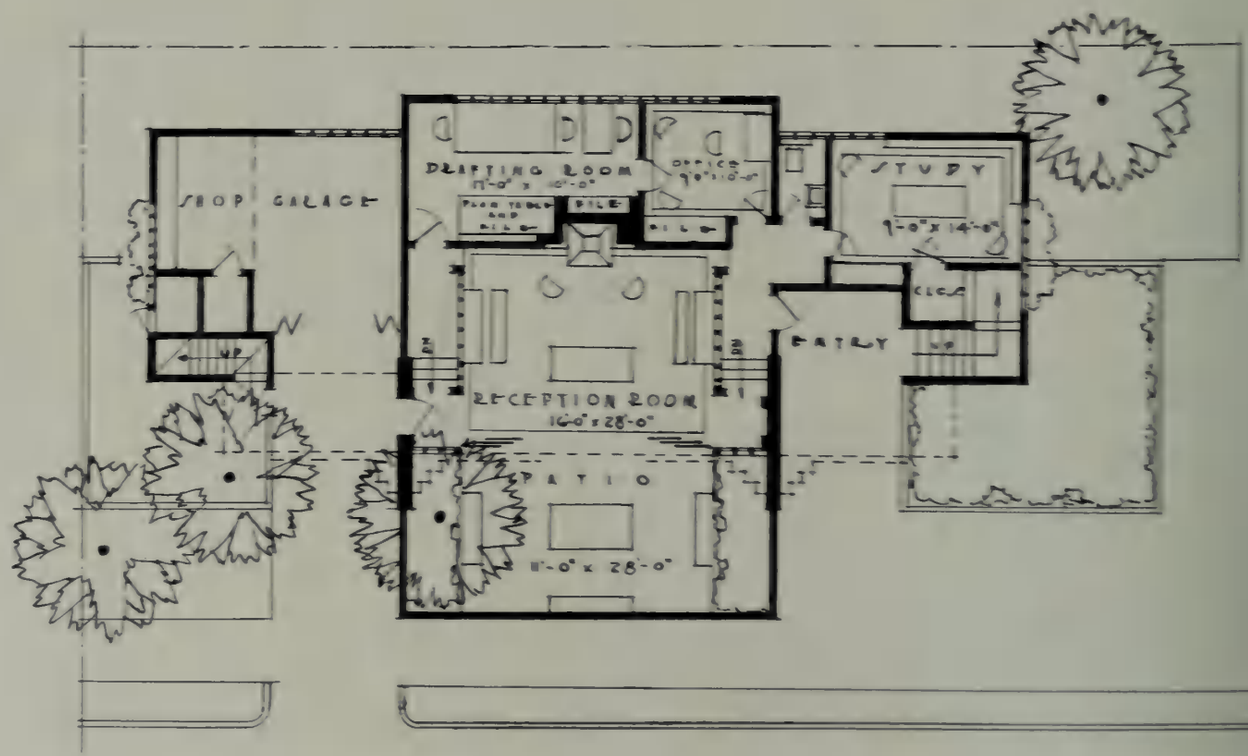
The bookcase is composed of glass shelves supported on lightweight angles, chromium-plated . . . Walls are decorated with few pictures or drawings so as not to be restless in effect . . . The chairs are of steel tubing, chromium-plated with heavy-pigskin seats and backs.



Desk of steel tubing, chromium - plated, with heavy plate glass top. Drawers and cubby-holes are eliminated to prevent accumulation of various items in a disorderly manner during the day. No maintenance other than dusting required . . . Lighting is obtained by a lamp trough reflector fastened to the desk with a swivel joint.

OFFICE OF
BOWMAN BROTHERS, ARCHITECTS
CHICAGO, ILL.





FIRST FLOOR PLAN
SCALE 1/8" - 1'-0"

STUDIO OF LLOYD WRIGHT ARCHITECT LOS ANGELES CALIF.



OFFICE EXTERIOR ↑ ↓ DRAFTING ROOM



OFFICE OF
WEBER AND SPAULDING, ARCHITECTS
LOS ANGELES, CALIF.

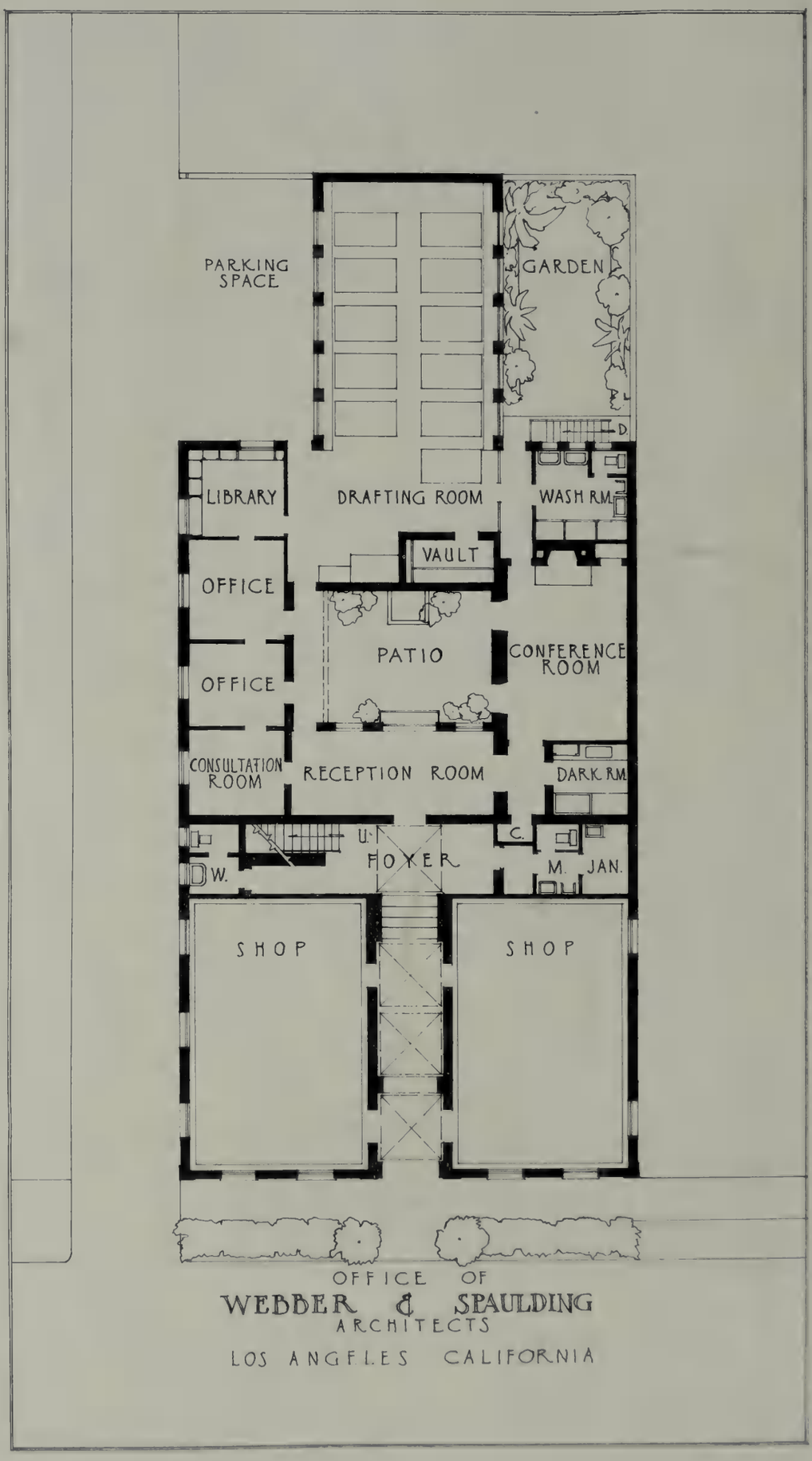

PARKING SPACE
GARDEN
D.
LIBRARY
DRAFTING ROOM
WASH RM.
VAULT
OFFICE
PATIO
CONFERENCE ROOM
OFFICE
CONSULTATION ROOM
RECEPTION ROOM
DARK RM.
U.
C.
W.
FOYER
M.
JAN.
SHOP
SHOP
OFFICE OF
WEBBER & SPAULDING
ARCHITECTS
LOS ANGELES CALIFORNIA



Photo. Clarke

PATIO

OFFICE OF
WEBER AND SPAULDING, ARCHITECTS
LOS ANGELES, CALIF.



Photo. Clarke

OFFICE OF
WEBER AND SPAULDING, ARCHITECTS
LOS ANGELES, CALIF.

CONFERENCE ROOM

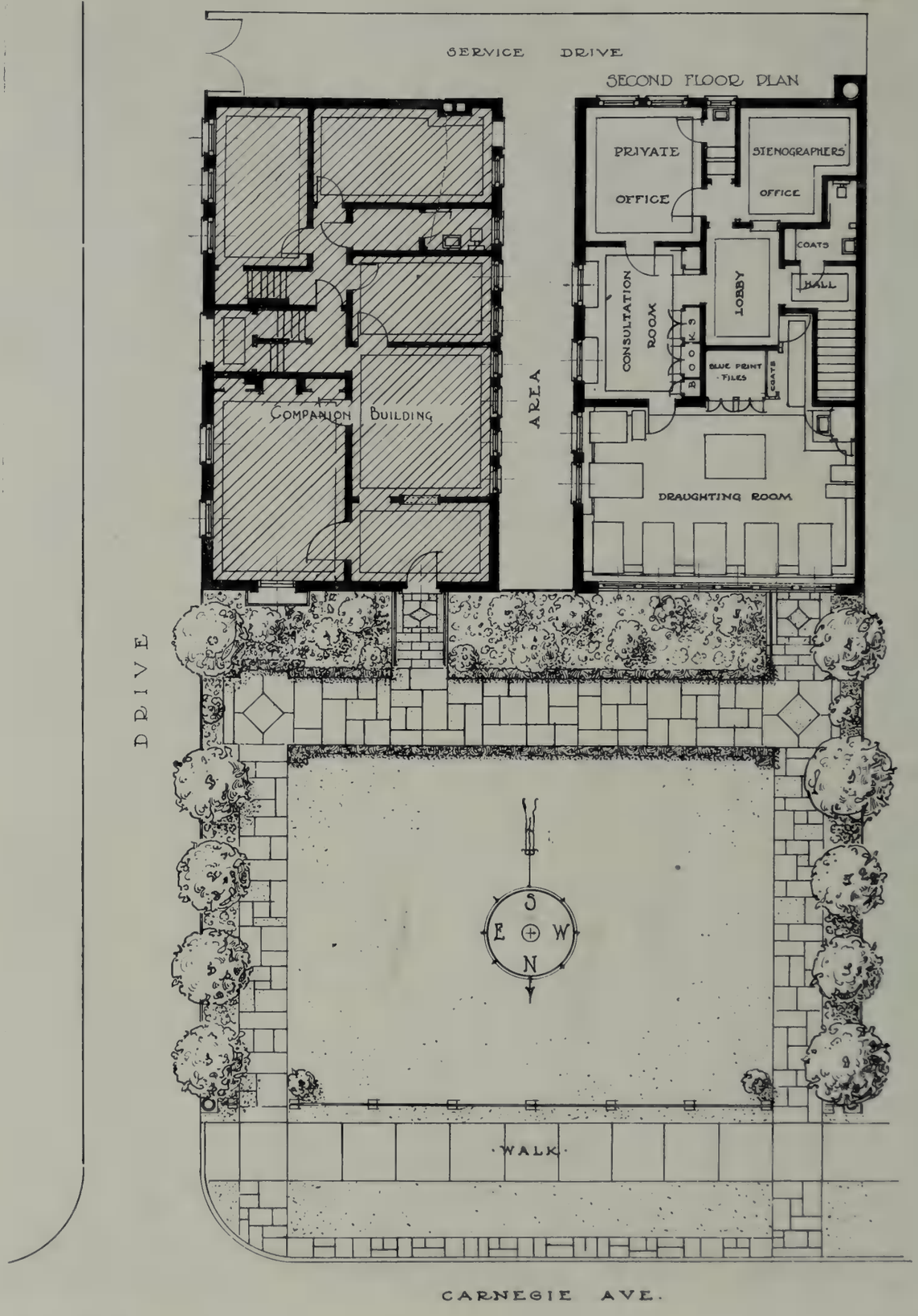


Photo. Hewitt

OFFICE BUILDING

Designed by Howell and Thomas, architects, who occupy the neighboring companion building.

OFFICE OF
PITKIN AND MOTT, LANDSCAPE ARCHITECTS
CLEVELAND, OHIO



OFFICE OF
PITKIN AND MOTT, LANDSCAPE ARCHITECTS
CLEVELAND, OHIO



Photo. Bourke-White

OFFICE OF
PITKIN AND MOTT, LANDSCAPE ARCHITECTS
CLEVELAND, OHIO



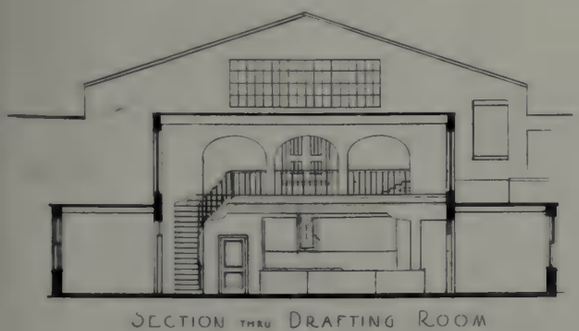
Photo. Hewitt

OFFICE OF
PITKIN AND MOTT, LANDSCAPE ARCHITECTS
CLEVELAND, OHIO

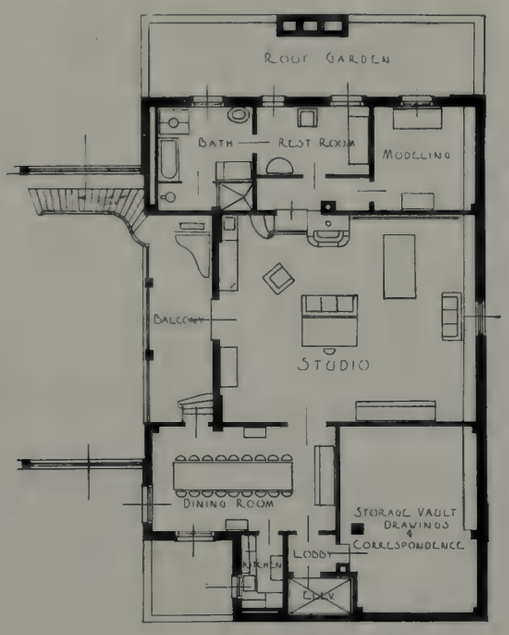


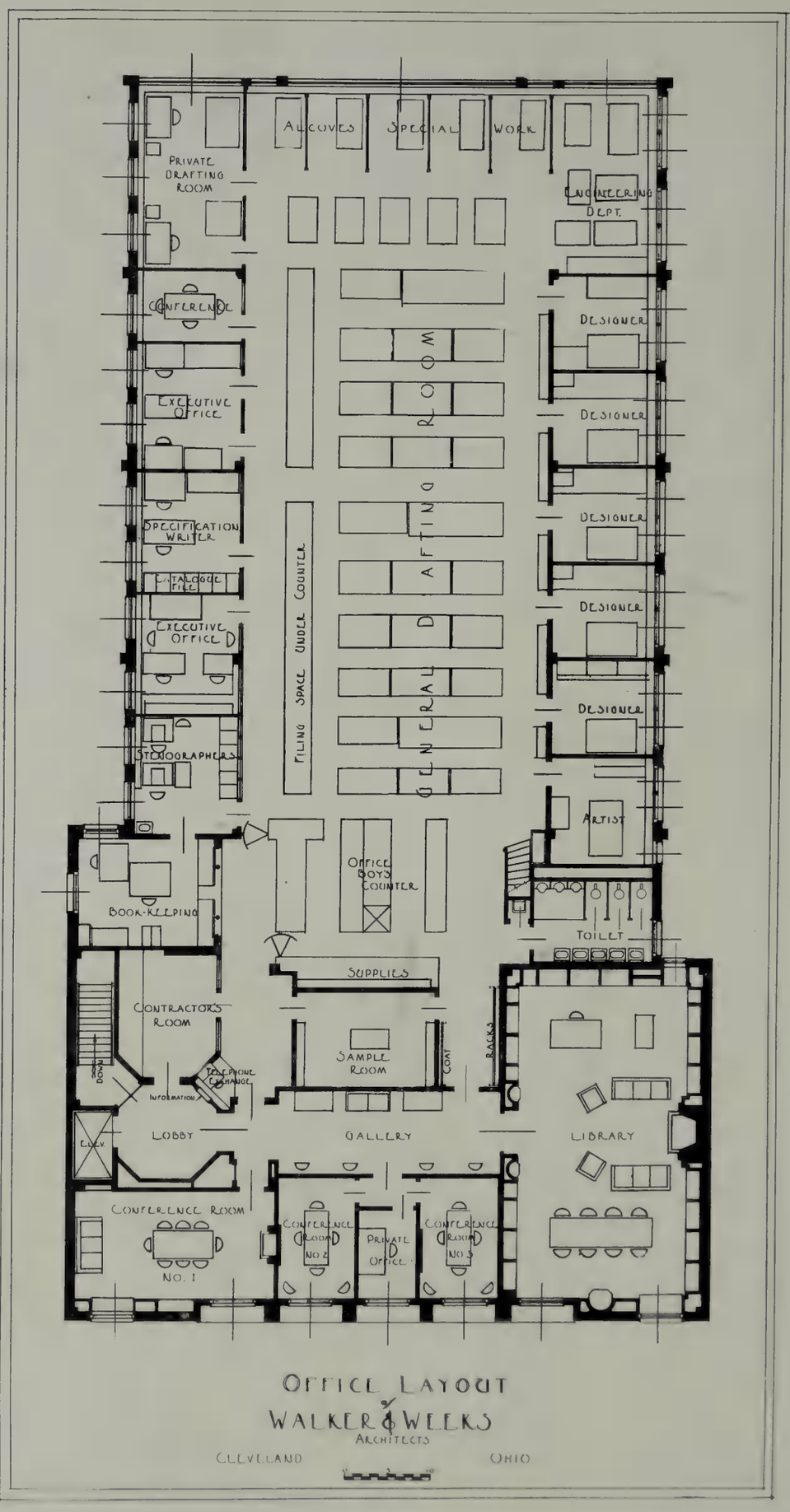
Photo. Lazarnick

DRAFTING ROOM FROM STUDIO BALCONY
OFFICE OF WALKER AND WEEKS, ARCHITECTS
CARNEGIE BUILDING
CLEVELAND, OHIO



SECTION THRU DRAFTING ROOM





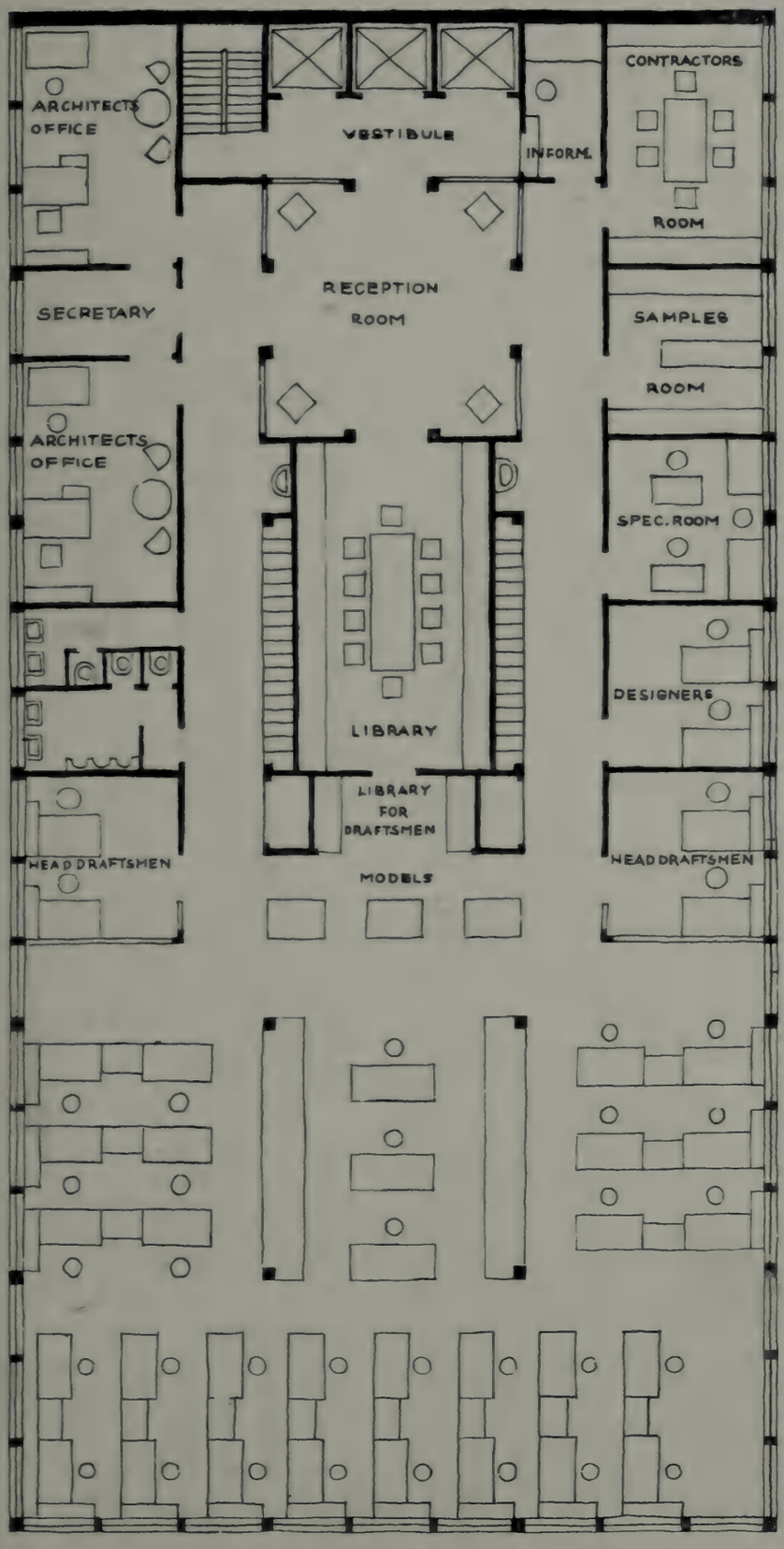
OFFICE LAYOUT

WALKER & WEEKS
ARCHITECTS

CLEVELAND OHIO

Each job or commission is placed in charge of an executive and a designer with a job captain and suitable corps of draftsmen. The six designers' offices are located opposite those of the executives in charge, with the drafting force for the job between them. All drawings are maintained in files in the drafting room and made readily accessible to the executives, designers and draftsmen.

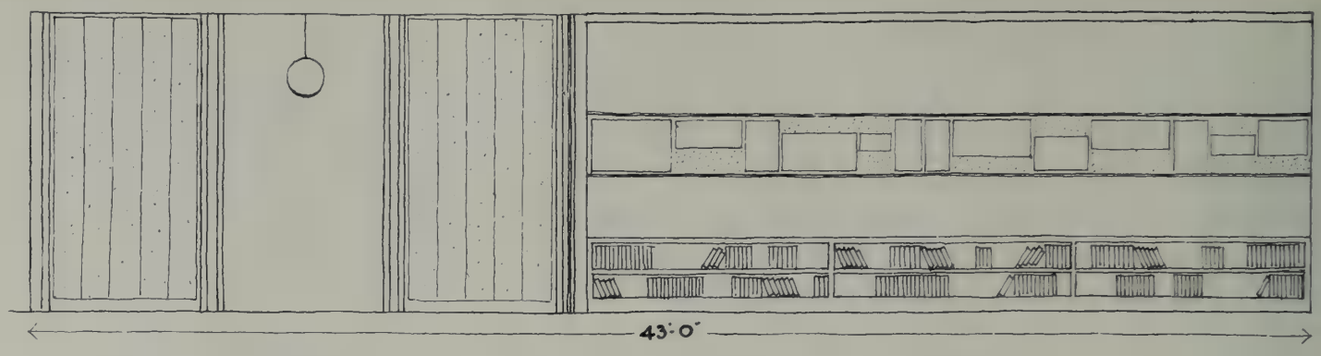
TYPICAL FLOOR PLAN FOR A LARGE ARCHITECTURAL OFFICE



DESIGNED FOR
THE ARCHITECTURAL RECORD

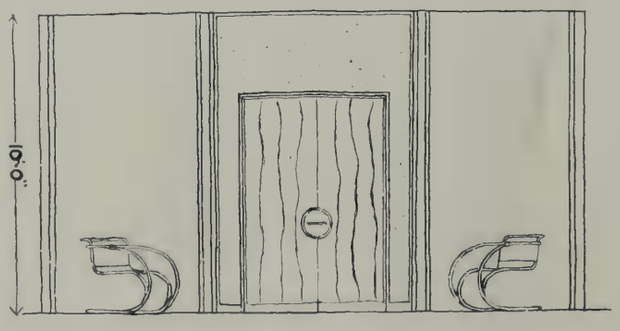
BY HELMUT HENTRICH,
ARCHITECT

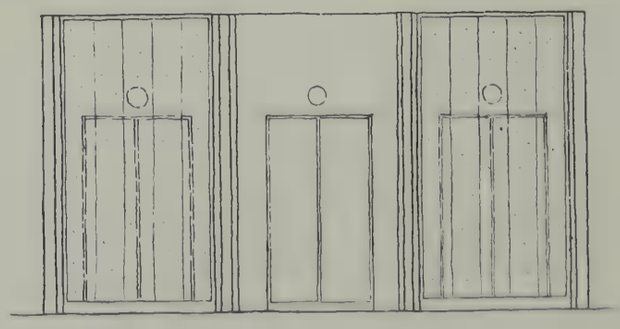
The firm of two members is assumed to employ 30 draftsmen in addition to the head draftsmen, specification writers, designers and others. The aim was to give each man as much outside light as possible. Consequently the reception room and library are placed inside and illuminated artificially.



AN ARCHITECTURAL OFFICE, HELMUT HENTRICH, ARCHITECT

The library is painted a light color. Overhead light through frosted glass as shown on next page. Table top is plate glass. Chairs are of MR (Mies van der Rohe) design, steel chromium-plated. Along the walls above the bookcases cork boarding permits the display of photographs and plans of executed buildings.





Walls of the reception room are of colored transparent glass. The wall between library and reception room is of opaque glass. The glass is held in place by aluminum-plated steel columns. Floor in black and gray linoleum. Illumination from PH lighting fixture. Chairs and tables are of MR (Mies van der Rohe) design.



RECEPTION ROOM



LIBRARY

AN ARCHITECTURAL OFFICE, HELMUT HENTRICH, ARCHITECT

". On the lower floor is the entrance hall where the telephone operator receives visitors, also the general business office, library and private offices. . . . On the floor above is a private room for the specification writer. In one corner the heads of the drafting room have their tables and one stenographer takes care of their messages and letter writing. We find this arrangement works out much better than any we have had before, as the stenographer can relieve the job captains of much detail . . . The filing of drawings is done in specially made pasteboard boxes, except for current jobs."





OFFICE LAYOUT
39TH FLOOR

OFFICE OF
WALKER AND GILLETTE
ARCHITECTS
NEW YORK

THE UNIVERSITY BRIDGE AT PHILADELPHIA

PAUL P. CRET
ARCHITECT

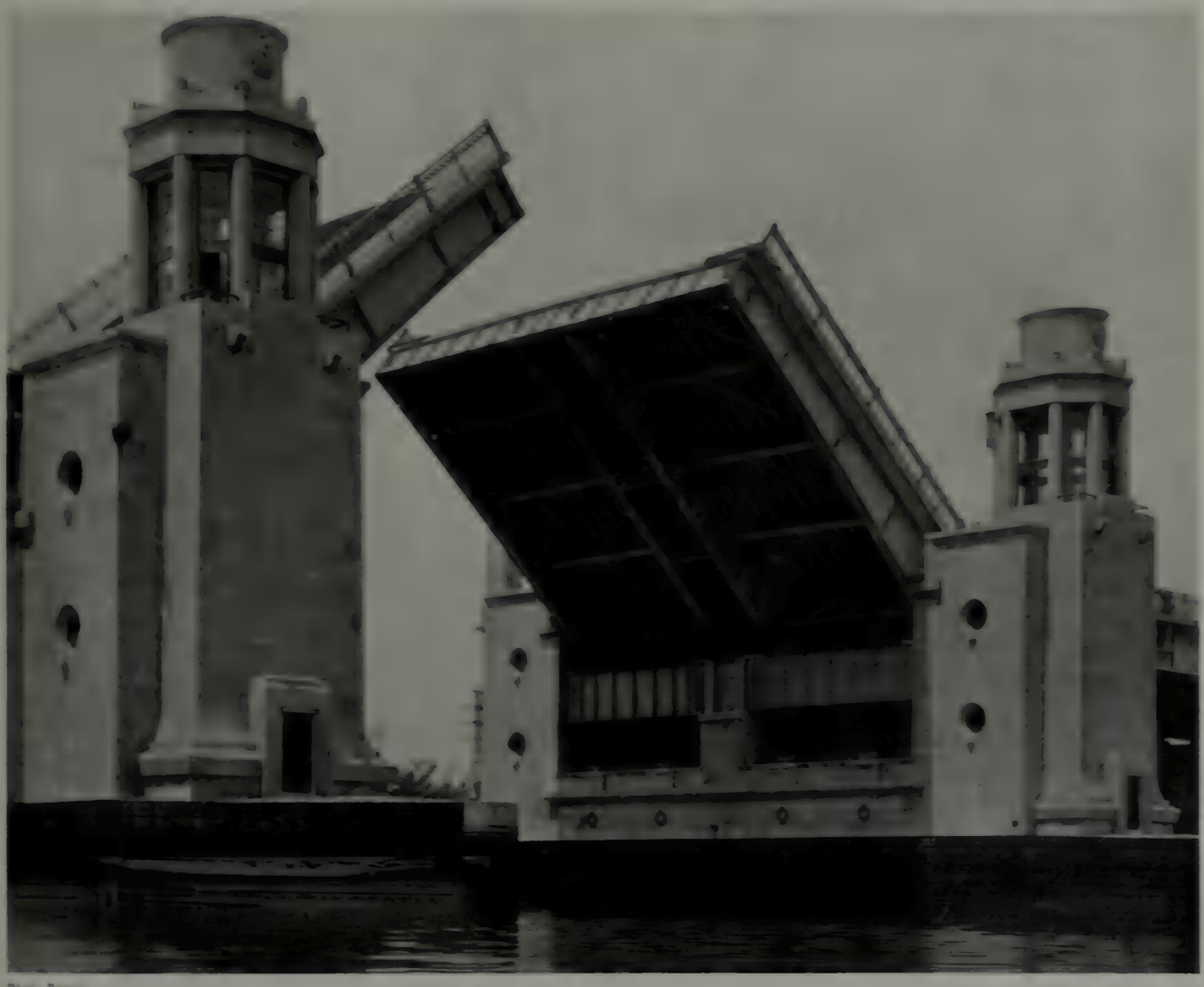


Photo Rittase

DRAWGATES



Photo. Rittase

THE UNIVERSITY BRIDGE AT PHILADELPHIA
PAUL P. CRET, ARCHITECT



Photo. Rittase

THE UNIVERSITY BRIDGE AT PHILADELPHIA
PAUL P. CRET, ARCHITECT



Photo. Rittase

THE UNIVERSITY BRIDGE AT PHILADELPHIA
PAUL P. CRET, ARCHITECT



Photo. Rittase

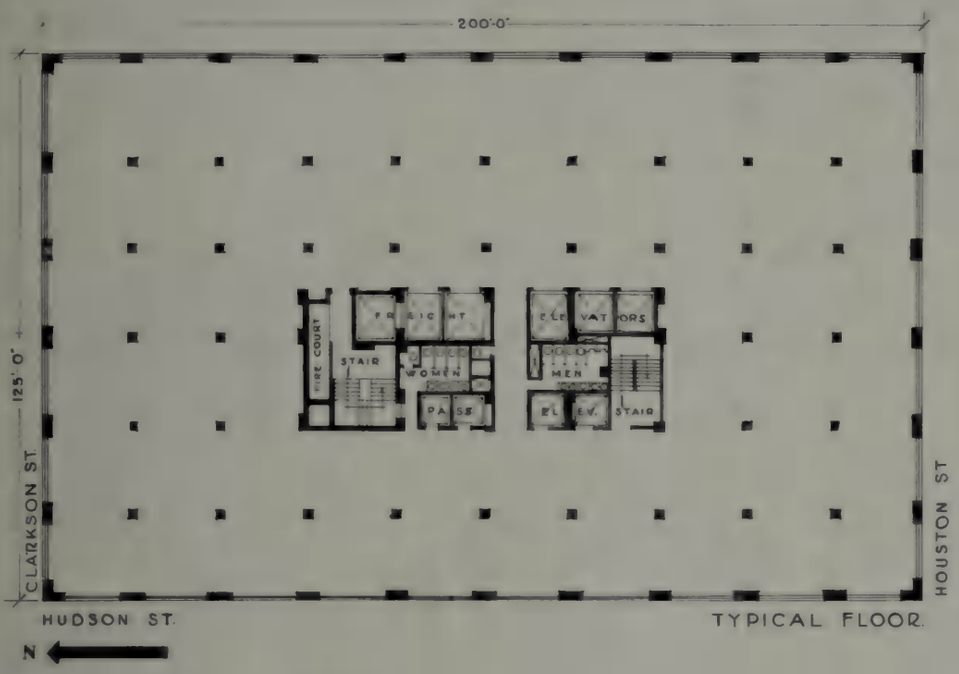
THE UNIVERSITY BRIDGE AT PHILADELPHIA
PAUL P. CRET, ARCHITECT



Photo. Rittase

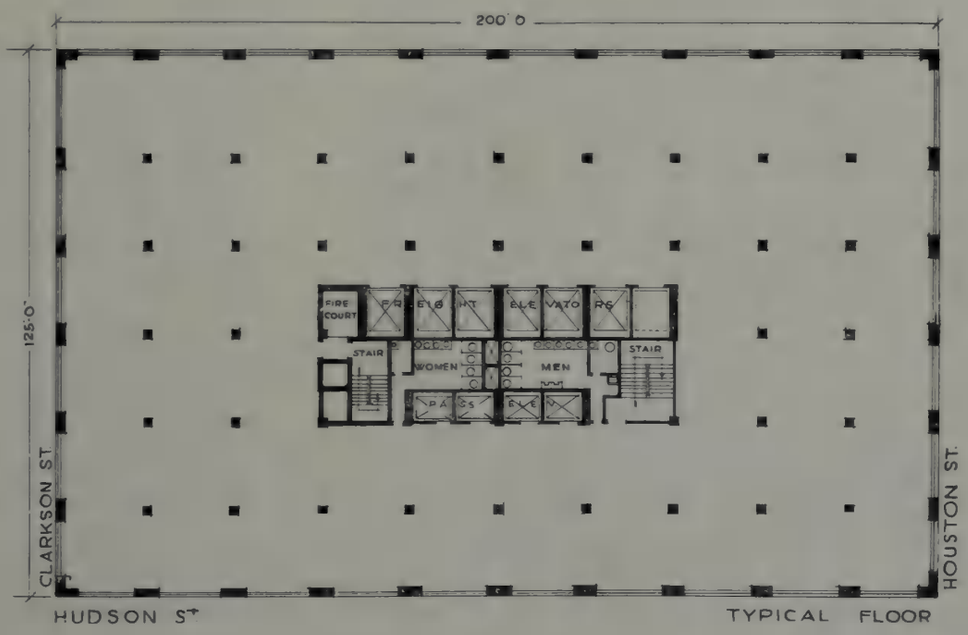
THE UNIVERSITY BRIDGE AT PHILADELPHIA
PAUL P. CRET, ARCHITECT

NOTES ON DRAFTING AND DESIGN



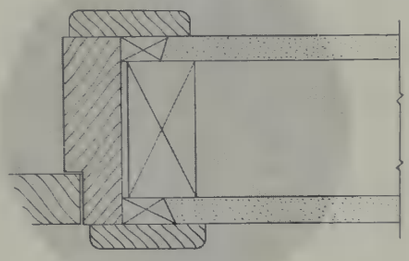
TYPICAL SOLUTION FOR THE LOFT BUILDNG

Floor plan studies of a proposed building for offices and heavy manufacturing in a vehicular tunnel section of Manhattan. Passage, stairway and facilities to occupy minimum of floor area and permit subdivision of floors with a minimum waste of cargo space. Toilets and stairs arranged for a maximum occupancy of 240 persons per floor. Plot is 200' x 125'. Three sides of building face on streets and one on low public building insuring permanent light on upper floors. Distance between columns is 20' and farthest distance from daylight from 40' to 50'. Floor area is 25,000 and total area 400,000 square feet, the building being 16 stories high.



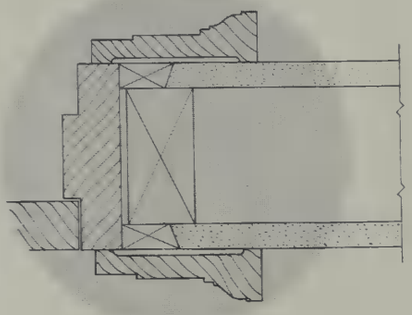
VICTOR MAYPER
ARCHITECT

ARCHITECTURAL MORPHOLOGY
EVOLUTION OF DOOR FRAME CONSTRUCTION



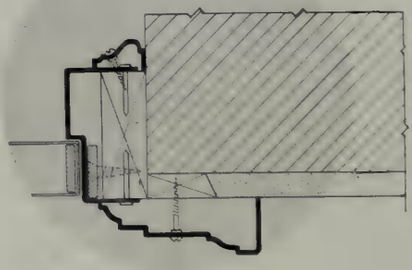
1

Wood construction. Unity of purpose, construction, tools, material, and form. Six separate units. Complex construction. Simple tools.



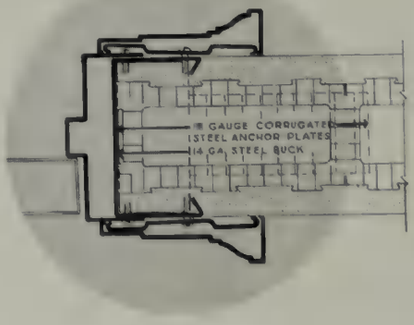
2

Arbitrary forms derived from stone architecture imposed on the construction. The projecting forms have not added anything to the purpose of the frame or to the ease of construction.



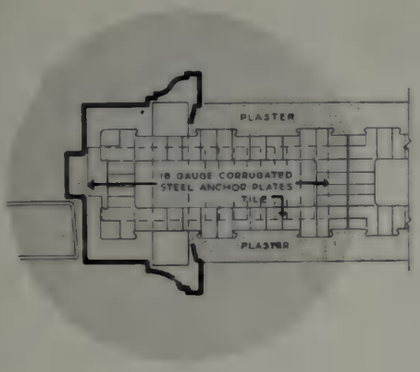
3

Steel door and frame with wood buck. The steel construction follows the traditional wood construction (use of screws). Gain: increased fire resistance and elimination of shrinkage. But the construction involves two trades and has become more complicated. Poor anchorage.



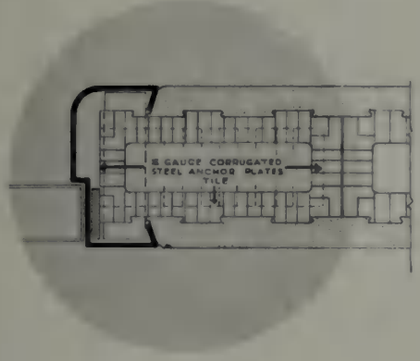
4

All steel construction. New materials do not necessarily generate new forms. The conventional forms, arbitrarily passed on from stone over wood to steel have only been slightly modified by the new tools and by the limitations of the new material (the slightly rounded corners). Good anchorage. The concealed clip-fastening an innovation conditioned by the new material. Complex construction. Complex tools.



5

UNITRE frame. Elimination of material. Buck, frame and casing one unit erected with the wall. The arbitrary forms still remain although slightly simplified.



6

UNITRE frame. Again: unity of purpose, construction, manufacturing process, material, and form. A good solution of a clearly stated problem. Instead of six separate units—one fireproof, non-shrinking, factory made unit, erected as an integral part of the wall with a minimum of material and labor. Simple construction. Complex tools.

Below: Metal profiles from a manufacturer's catalog. Left: Architectural profiles. An indefinite number of variations of the same arbitrary form elements. Right: Profiles for showcases, display windows, etc. A great variety of forms created by clearly stated problems and determined by this specific purpose, construction, material, and tools.







English chair, 17th century



Steel chair by MARCEL BREUER
Bauhaus Dessau, Germany, 1926



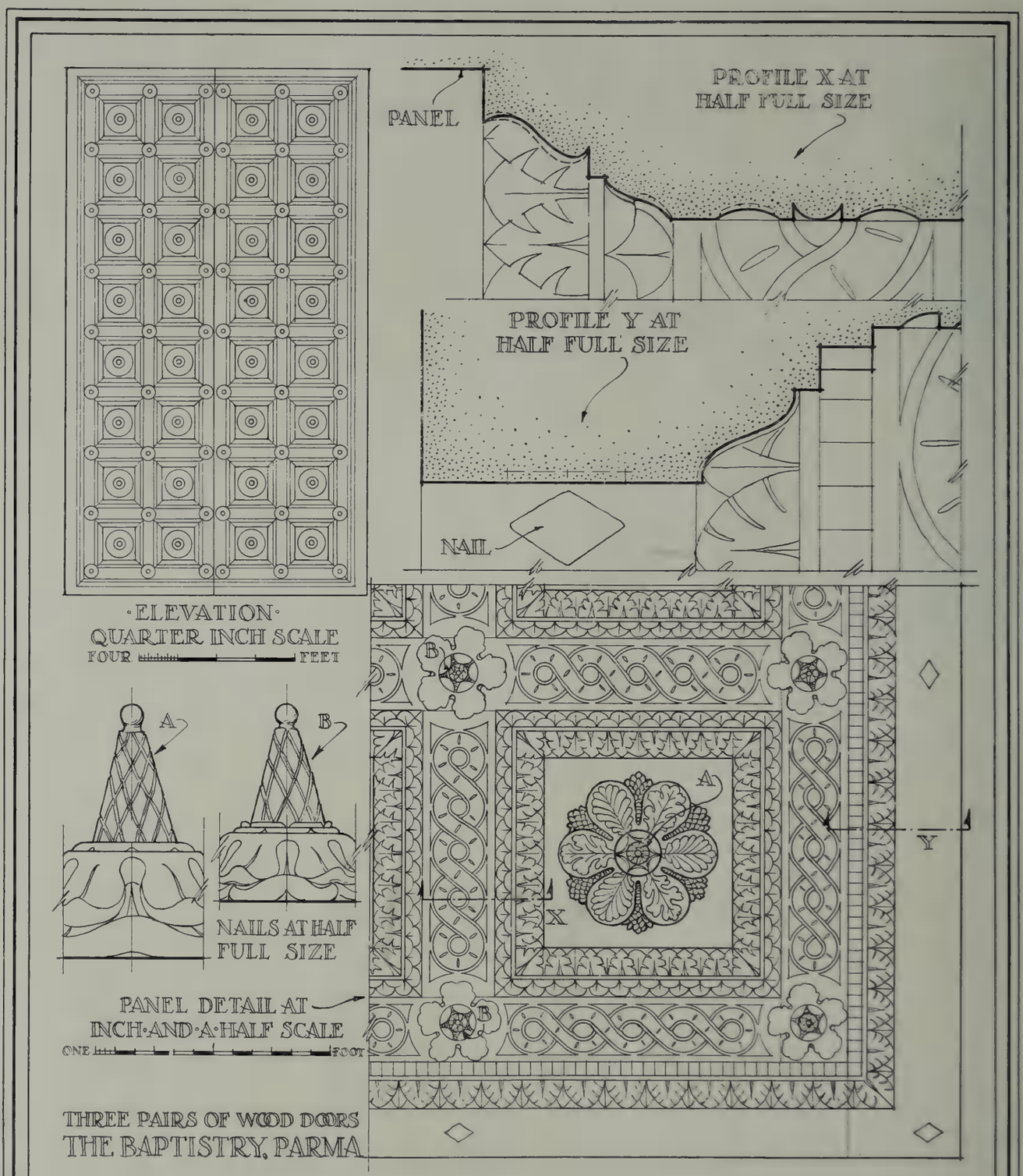
GENERAL VIEW

RENAISSANCE DOORS
FROM THE BAPTISTRY, PARMA, ITALY

NAIL STUDDED DOORS FROM NORTH ITALY

Second Series. (First series appeared in the June, 1930 issue)

MEASURED, DRAWN AND
PHOTOGRAPHED
BY MYRON BEMENT SMITH



NAIL STUDDED DOORS
FROM NORTH ITALY

SERIES 2 — PLATE 1

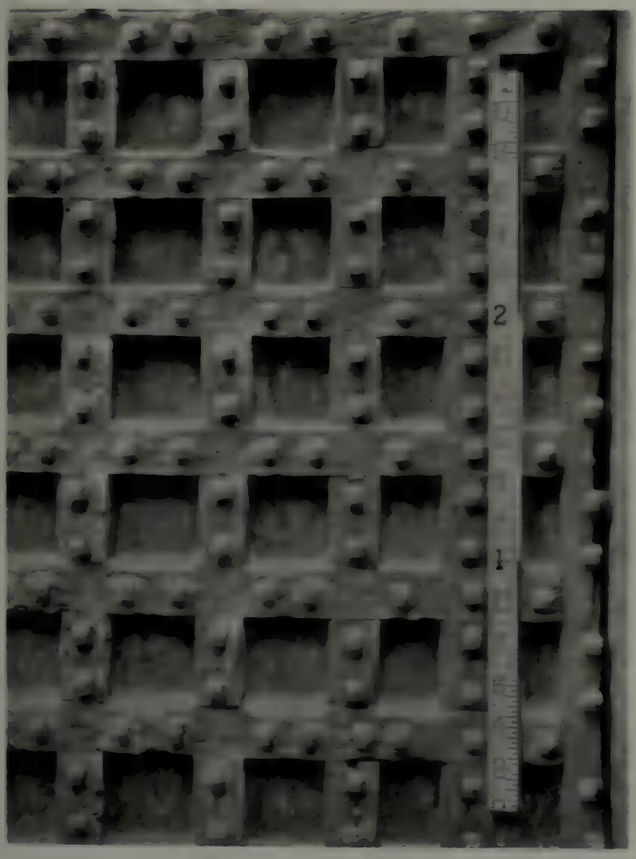
MEASURED, DRAWN AND PHOTOGRAPHED BY
MYRON BEMENT SMITH



DETAIL OF LEFT DOOR,
THE CATHEDRAL, PIACENZA



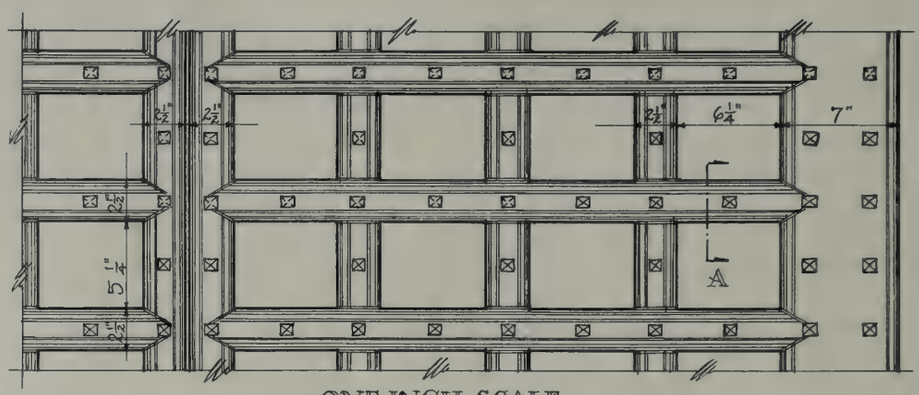
DETAIL OF RIGHT DOOR,
THE CATHEDRAL, PIACENZA



DETAIL OF DOOR,
S. FRANCESCO, BRESCIA



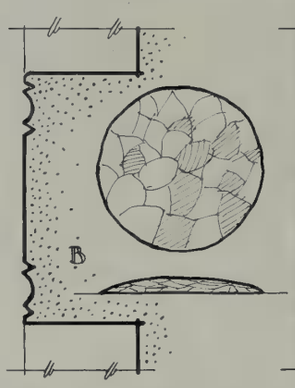
GENERAL VIEW OF DOORWAY,
S. FRANCESCO, BRESCIA



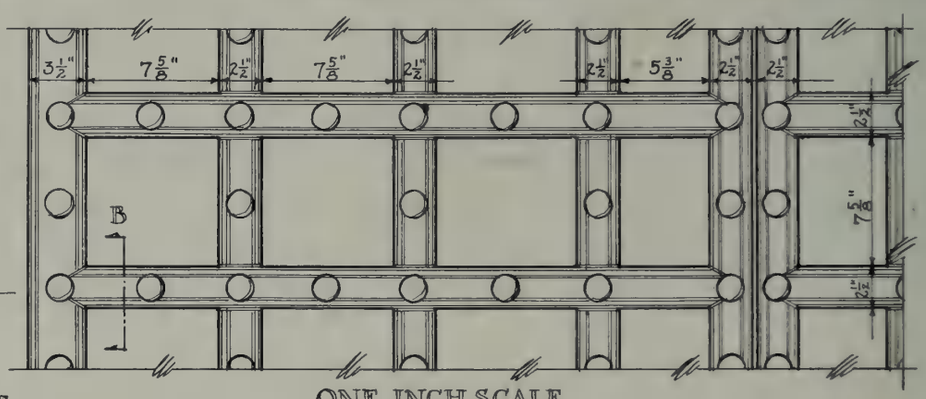
ONE INCH SCALE
THE CATHEDRAL, PIACENZA



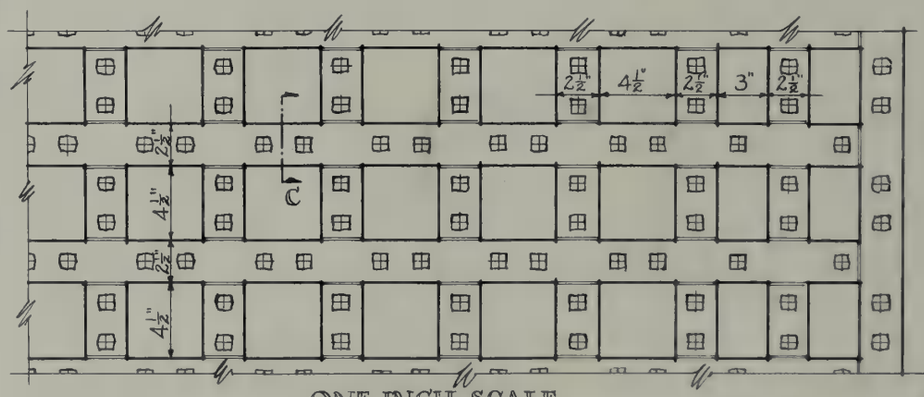
NAIL AND PROFILE
AT HALF FULL SIZE



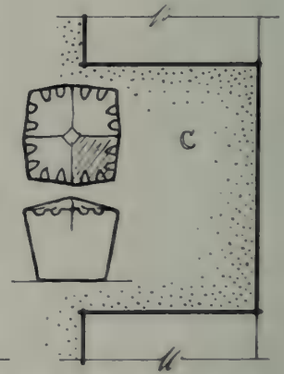
NAIL AND PROFILE
AT HALF FULL SIZE



ONE INCH SCALE
THE CATHEDRAL, PIACENZA



ONE INCH SCALE
S. FRANCESCO, BRESCIA



NAIL AND PROFILE
AT HALF FULL SIZE

NAIL STUDDED DOORS
FROM NORTH ITALY

SERIES 2 — PLATE 2

MEASURED, DRAWN AND PHOTOGRAPHED BY
MYRON BEMENT SMITH



GENERAL VIEW OF DOORWAY,
THE CATHEDRAL, CREMA



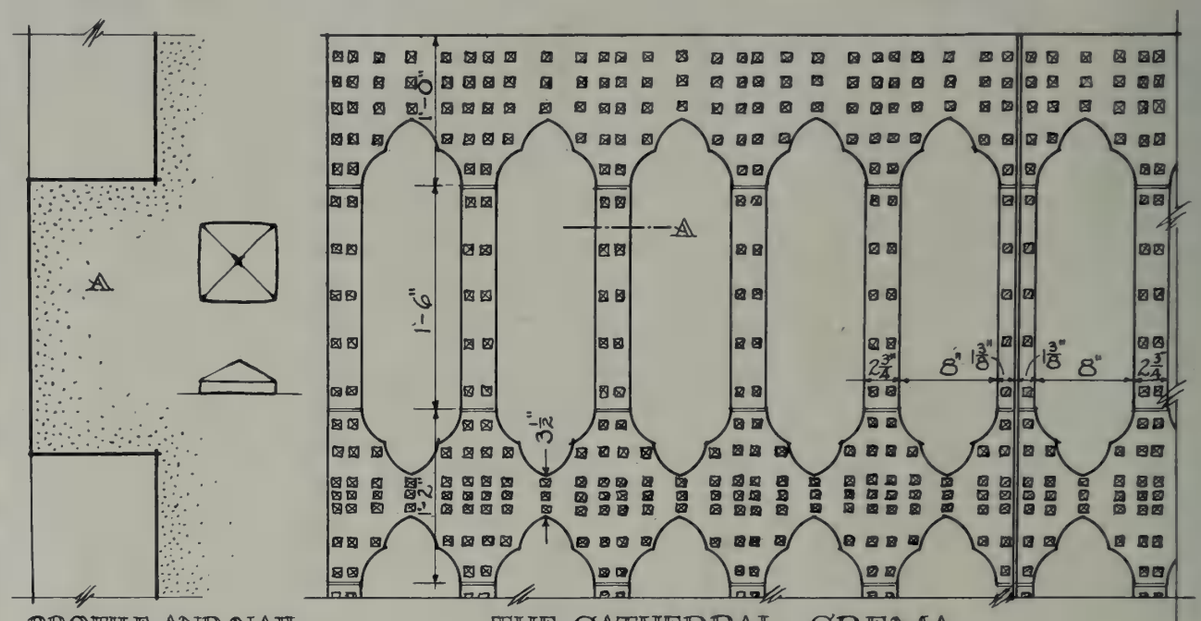
DETAIL OF DOOR,
THE CATHEDRAL, CREMA



GENERAL VIEW OF DOORWAY,
COLLEONI CHAPEL, BERGAMO



DETAIL OF DOOR,
COLLEONI CHAPEL, BERGAMO



PROFILE AND NAIL
AT HALF FULL SIZE

THE CATHEDRAL, CREMA
THREE-QUARTER INCH SCALE
TWO FEET



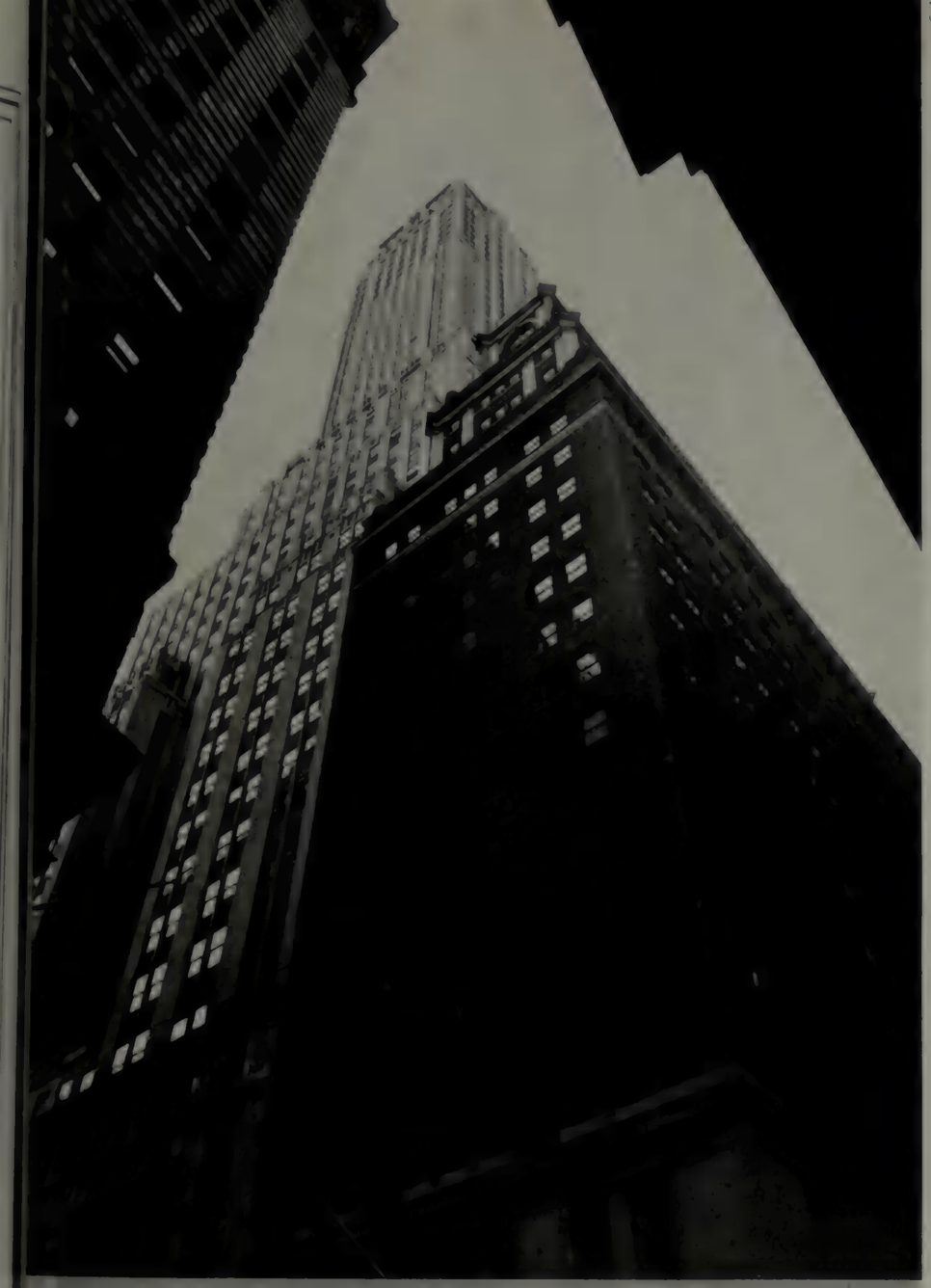
CAPPELLA COLLEONI, BERGAMO.
G.A.AMADEI, ARCHT. 1476
ONE AND ONE HALF INCH SCALE
ONE FOOT

NAILS
AND
PROFILE
AT HALF
FULL
SIZE

NAIL STUDDED DOORS
FROM NORTH ITALY

SERIES 2. PLATE 3

MEASURED, DRAWN AND PHOTOGRAPHED BY
MYRON BEMENT SMITH





THE ARCHITECTURAL RECORD: AUGUS
TECHNICAL NEWS AND RESEARC

THE WEEK-END HOUS

BY KNUD LÖNBERG-HOL

NEXT MONTH

RESTAURANTS, CAFETERIAS, COFFEE SHO



Underwood and Underwood



Galloway



Galloway

The week-end flight from the city to the country is a logical human reaction to the social and spatial pressure of the large city.



Galloway

THE WEEK-END HOUSE

By K. LÖNBERG-HOLM

PURPOSE

The week-end in the country provides for:

1. *A friendly and unselfish contact with nature.*
2. *Sunlight and fresh air.* (Physical health.)
3. *Relief from the congestion and pressure of the city.* (Sport, physical expansion.)
4. *A necessary balance to the increasing demands and restrictions of a commercial, competitive society.* (Psychological expansion.)

DEFINITION

The week-end house is the minimum stationary setting for a family life reduced to its simplest terms in close contact with sun, soil, and sky and freed from obsolete social and architectural forms. It is not a city residence transferred to the country, nor a suburban bungalow reduced in scale.

DESIGN CRITERIA

1. *Maximum direct contact with nature.*
2. *Minimum spatial pressure (not a box).*
3. *Maximum protection against insects, temperature, rain, and inquisitive persons.* (The log cabin was an adequate protection against hostile natives and wild animals. Wire screens are sufficient protection against mosquitoes.)
4. *Maximum ease and safety of life.*
5. *Minimum cost of construction and maintenance.* (Carrying charges operate the entire year against the limited and short occupancy.)
6. *Maximum plastic unity with surroundings.*



Galloway



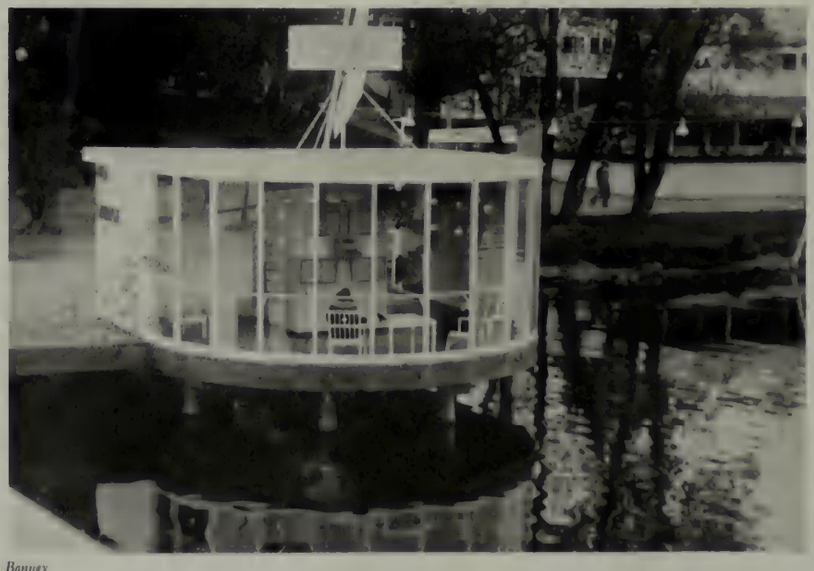


World Wide Photos

1910 **1930**



Bonney



Bonney

Light, open structures. The right setting for a life in close and friendly contact with nature.

STOCKHOLM EXPOSITION 1930

LOCATION AND SITE

The choice of location and site should be governed by a survey covering:

1. *Climatic conditions and surrounding nature.* Suitable exposure. Proper amount of shade. Trees offer a valuable protection from winds, but if the forest is dense, the air movement is reduced to such an extent as to interfere with comfort. Underbrush, weeds and tall grass should be removed from the immediate house site, because they offer shelter to mosquitoes and flies.
2. *Topography and soil texture.* The topography of the site should be such that the slopes are steep enough to permit rapid drainage of surface water during rains. Week-end houses to be occupied in the summer preferably should be located on hillsides with an eastern exposure, while those occupied in winter should be located on hillsides with a southern exposure. An eastern exposure is valuable because the sleeping quarters will be exposed to the early morning sun without the necessity of exposing the house to the hot afternoon sun. For this reason it is desirable to locate the house on the western shores of lakes or larger streams, where it may be protected on the west by woods or by shade trees.

A soil texture that readily absorbs water is necessary to maintain a dry site. A porous soil is therefore preferable. The character of the soil and the subsurface formations have an important bearing upon the quality and the quantity of ground water available.

3. *Distance from residence and accessibility.* Means, cost and time of transportation. The site should be remote, but accessible.
4. *Distance from highways and neighbors, and size of site.* The house should be surrounded by protective vacant area, which will furnish necessary privacy.
5. *Available facilities.* Water, food supplies, sewage disposal, etc.
6. *Cost or rent of site.*
7. *Cost of available building materials and labor.*

LAYOUT

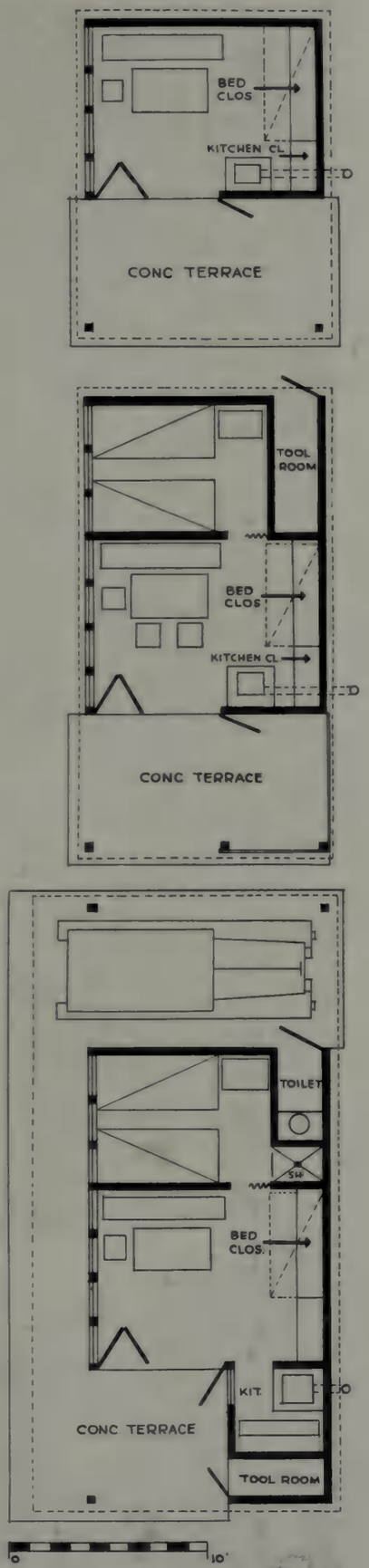
ELEMENTS:

1. *A shelter against heat, cold, rain, and insects.*
2. *A place for sunbath.*
3. *A place to prepare the food.*
4. *A place to eat.*
5. *A place to sleep.*
6. *A place to dress.*
7. *A place to wash.*
8. *Sanitary accommodations.*
9. *Storage space for baggage.*
10. *Storage space for food supplies.*
11. *Parking space for cars.*

The layout should be made with a minimum of means. The space used by day should be convertible for use by night in order to reduce the cost of the structure. Accommodations for guests should be provided. Privacy at night should be insured the owner.

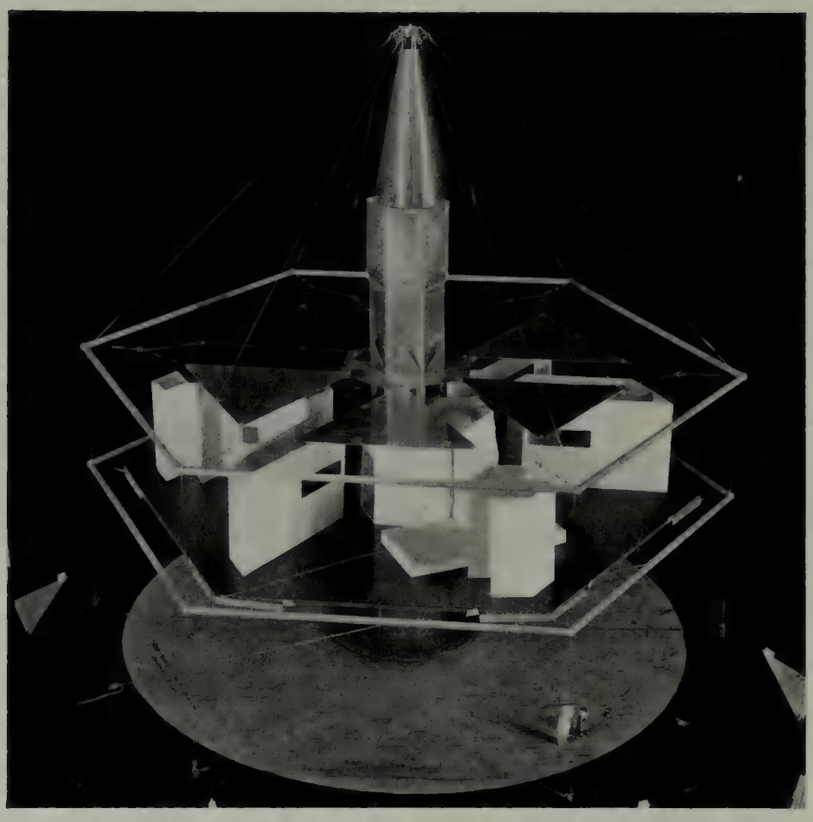
A minimum of fifty square feet of floor space and five hundred cubic feet of air space for each occupant exclusive of space for storage of clothes and sanitary purpose is recommended.

Provision should be made for parking of cars. The simplest solution is an open parking space or the use of canvas covers. If the house is located on a slope or is raised from the ground, a covered parking space can be provided under the house.



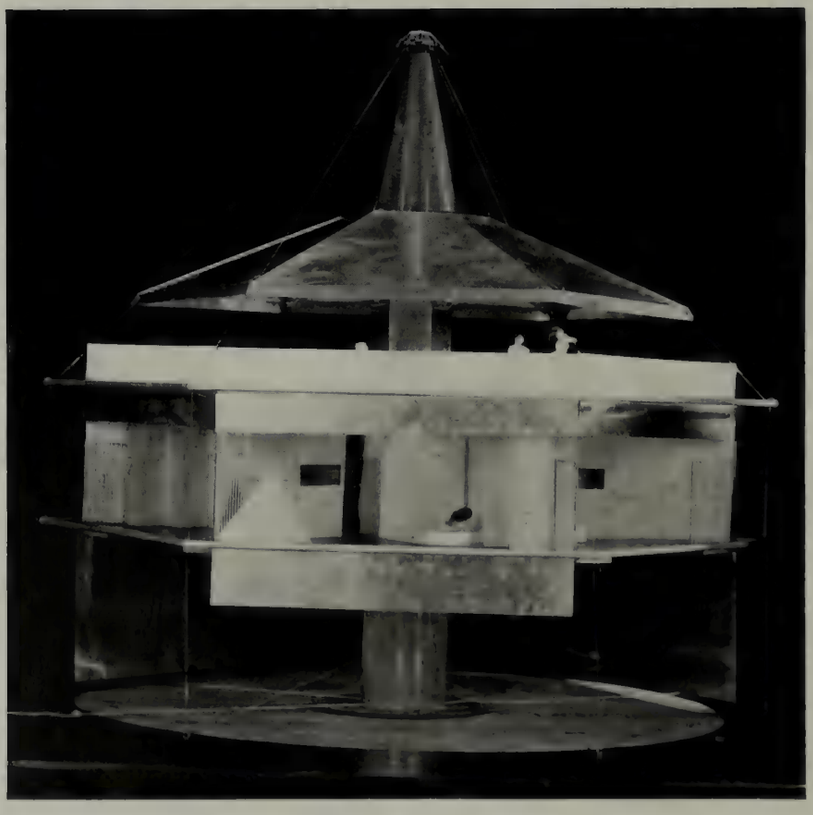
New units can easily be added to this week-end house.

RICHARD WEBER, Architect



A rational construction erected with a minimum of labor. Model for the DYMAXION HOUSE designed by R. BUCKMINSTER FULLER.

Partially assembled structure showing mast and six radial tension cables carrying entire weight; hexagonal arrangement of horizontal tubular compression struts, flexibly joined; metallic tension webbing floor supports uncovered on top deck and covered on lower deck by pneumatic duralumin bladders topped off by black bakelite deck; breathing louvres at masthead and translucent partition walls.



Finished structure showing duralumin awning, central mast with elevator and vertical grouping of conduits for heat, light, air, disposal and water; translucent non-breakable panes inclosing vacuums for outer walls; translucent ceilings; a bedroom indirectly floodlighted with one triangular metallic window shutter partially drawn; parking space under the house; the whole structure suspended from the mast.

CONSTRUCTION

The construction should be governed by:

1. *Specific function.*

 The structure should shed the rainwater easily, should admit a maximum of sunlight and fresh air, and should provide maximum visibility from the inside.

 The construction should therefore provide a maximum of window space and openings screened against insects and protected from rain. The construction should insure maximum flexibility of the plan for the purpose of full utilization of the space by day and by night. (Use of folding partitions, dividing curtains, etc.) It should easily expand to take care of guests. Additional space can be provided by means of screened porches, utilization of roof for sleeping porches or temporary tents.

2. *Initial cost.*

 The initial cost should be as small as possible without the use of inferior construction or material. (The construction should be substantial in order to obtain easy loans.) The structure should therefore be erected without expensive labor and in the shortest possible time. The erection should be reduced to easy assembly of ready-made and easily handled units by the owner or by unskilled local labor.

3. *Cost of maintenance and cleaning.*

 Week-end houses will be exposed to more severe weather conditions than will the city house. They must be shut up for long periods without care. When opened they must be ready for immediate use despite the neglect to which they inevitably will be subjected.

 Screens, awnings, tent extensions, and flies should be stored away during the unoccupied season with maximum ease. Openings should be protected with shutters and the structure made inaccessible. The house should be easily cleaned. All inaccessible dirt corners should be avoided.

4. *Climatic conditions and local codes.*

MATERIAL

1. *All materials used for the structure and the equipment should be manufactured and transported with minimum cost.*
2. *They should be easily erected, replaced or repaired.*
3. *They should be moderate in first cost, but durable enough to go along for years without painting or appreciable repairs and replacement.*
4. *They should be proof against the attack of fungi, insects and rats.*
5. *They should be impervious to water and resistant to fire and atmospheric conditions* (corrosive action of salt air at seashores). *All metals should be non-corrosive.*
6. *All surfaces should be easily cleaned.*
7. *The number and quantity of materials used should be reduced to a minimum for the sake of economy and visual unity.*

The following is an extract taken from a recent publication of the United States Department of Agriculture entitled "Termites in Buildings," Leaflet No. 31:

"Proper construction when building is essential and the following suggestions will assist in preventing damage and loss from termite activities in frame construction.



Courtesy the Patent Scaffolding Co., New York

. . . easy assembly of ready-made and easily handled units.



Bonney



Bonney

Maximum result with a minimum of means. The economic principles of airplane construction should be applied to the week-end house. Rational utilization of light, strong materials.

STOCKHOLM EXPOSITION 1930

"Wood or fiber products, when an approved preservative has not been forced into the product, shall not be placed in the earth or within 18 inches thereof, excepting wood columns or posts over a concrete floor, which columns shall be provided with noncorroding metal or concrete base plates or footings 6 inches above the floor. This applies to steps, which shall be laid over a concrete base, projecting at least 6 inches beyond the supports of the steps.

"Timber to be used in contact with the earth shall be thoroughly impregnated by a standard pressure process with coal-tar creosote or other equivalent preservative. Timber should be completely cut to proper dimensions before treatment, whenever possible, but when cutting after treatment is unavoidable all cut surfaces shall be thoroughly coated with coal-tar, creosote or other equivalent preservative.

"Masonry foundations and footings shall be laid in Portland-cement mortar. Foundations built up of masonry units, whether hollow or solid, shall be capped below woodwork with at least 1 inch of Portland-cement mortar, or mortar and slate, or solid or joined noncorroding metal, or other equally artificial seal.

"In the case of frame buildings a metal termite shield shall be provided, continuing completely around the top of the masonry foundation, including all pillars, supports, and piping, below the woodwork of the building, on both the inside and outside surfaces. Such a shield may be formed of a strip of noncorroding metal (such as copper, zinc, or an alloy composed of 28 per cent of copper, 67 per cent of nickel, and 5 per cent of iron, manganese, and silicon), firmly inserted in the surface of the masonry, or between the foundation and the wood, with the projecting edge bent downward at an angle of 45° and extending horizontally at least 2 inches from the face of the foundation. In masonry buildings this shield can be inset in the masonry at a height at least 18 inches above the ground.

"Floor sleepers or joists embedded in masonry or concrete, or laid on concrete which is in contact with the earth, shall be impregnated with an approved preservative.

"Expansion joists between concrete floor and wall shall be filled with liquid asphaltum and the right-angle joint covered with a sanitary cement mortar or Portland cement concrete finish of an arc of at least 2 inches in length.

"The ends of wooden beams or girders entering masonry or concrete shall not be sealed in, but shall be provided with boxes affording an air space at the end of the piece of not less than 1 inch at side of member, unless the ends of such timbers are impregnated with coal-tar creosote or other approved preservative.

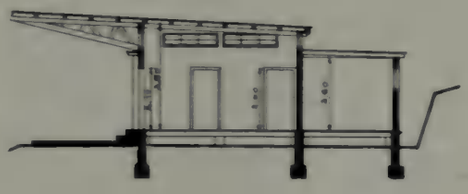
"Where there are spaces under floors near the earth they shall be excavated so that there will be no earth within 18 inches of the wood, and they shall be provided with cross-ventilation. Such ventilating openings shall be proportioned on the basis of 2 square feet for each 25 lineal feet of exterior wall, except that such openings need not be placed in front of such building. Each opening shall be provided with 20-mesh non-corroding metal screening, including windows and attics.

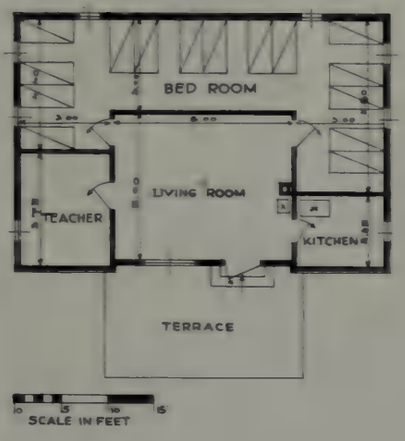
"Where timber is used in roofs of the flat type, the roof shall, unless protected on the weather side with a waterproof covering, have a slope and run-off sufficient to provide proper drainage.

"All wooden forms on foundations shall be removed from masonry work within 15 days; grading stakes shall be removed before laying concrete floors."







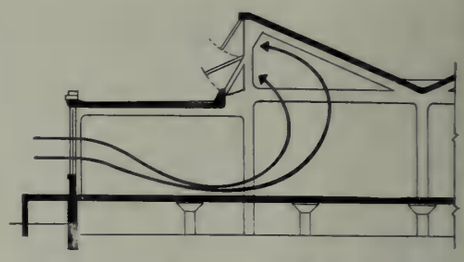


Week-end camp in the mountains.

KARL MEINHARDT, Architect

CONTROL OF TEMPERATURE AND VENTILATION

Control of temperature and proper ventilation should be insured with the simplest possible means. All materials used for roof, walls and partitions should have high insulating properties. Awnings, flaps and flies can be used as protection against sun and rain. The structure should be located on the site in such a way that the prevailing breezes can be utilized. Flaps and movable canvas screens can be used to catch the wind and lead it through the house. The design should insure natural cross-ventilation by utilization of the inevitable air currents.



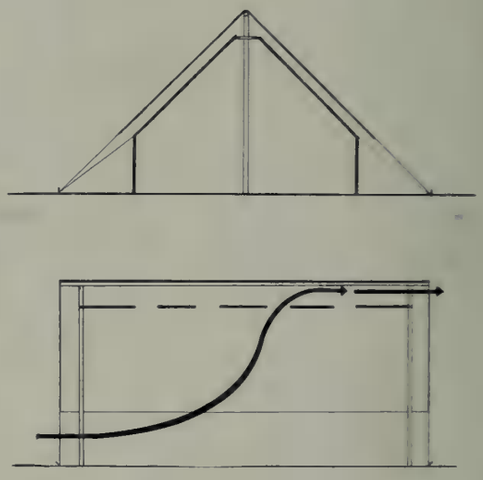
Natural ventilation of industrial plant.

PROTECTION AGAINST INSECTS

The structure should be thoroughly screened. It is good practice to have a screened space within the kitchen for the storage of imperishable food. Screens should have at least 16 meshes to the inch to keep mosquitoes out.

EQUIPMENT

A minimum of equipment should be used. It should be easily transported and stored away, light and collapsible, and able to withstand hard use. For sleeping accommodations there should be cots or bunks usable for seats in the daytime, or wall beds or roll-away beds that can be placed in wall closets. Portable bath tubs, camp stoves, heating stoves, ice-boxes, camp chairs and tables will serve the specific purpose. Lighting equipment will depend on the local conditions.



Natural ventilation of tent. Note the insulating space between tent and fly.

WATER SUPPLY

An adequate pure water supply is one of the most important requirements of the week-end house. An average of about 50 gallons per person per day is necessary for drinking and sanitary purposes if flush toilets, showers, and bath tubs are used. Less water is necessary if latrines are used. Showers require about 20 gallons of water per person per day, bath tubs about 10 gallons per person per day, flush toilets about 10 gallons per person per day, and for drinking and culinary purposes about 5 gallons per person per day.

The water supply may be obtained from three sources: rain water, ground water, and surface water. The method of supply will depend on the local conditions.

It is important to ascertain whether the water is safe for use. An analysis should be made each year before the season if the water supply is not chemically treated. It is possible to install a simple type of hydro-chlorinating system at low cost.

SEWAGE DISPOSAL

The local conditions of topography, geology, soil texture, location with reference to water supply, volume of sewage and other factors determine in each case the method of disposal and the location and size of disposal plant. The first requirement for a sewage disposal plant is a location where it cannot be a source of contamination to the water supply. This means that it should be, if possible, located entirely outside the catchment area which furnishes the source of surface or ground water supply, due consideration being given to the fact that a well or spring supply may receive its water from an area partly outside the limits of the superficial watershed. If the point of disposal must be upon this catchment area the disposal



Galloway

Revolving bath house with provision for sunbath.

plant should, as far as practicable, be located at as great a distance as possible from the source of the water supply, away from the lines of possible drainage toward such sources and at an elevation below the water level of this source. If the week-end house is furnished with a general water supply system and plumbing fixtures such as sinks, washbasins, and flush toilets a considerable amount of sewage will be created and the choice of location and method will involve additional factors, not only of a sanitary nature such as the protection of bathing beaches, use of a stream in which the sewage may be discharged and the possibility of creating a nuisance, but also a physical nature, such as the topography and the character of the soil.

The topography will affect such questions as whether the sewage will flow by gravity or must be pumped, what size and grades the sewers shall have, what possible site for sewage disposal is available to collect the sewage economically, and what type and proportions of structures are suited to the required degree of treatment of the sewage. The character of the soil will affect primarily the method of the disposal works, that is, whether by cesspool, subsurface irrigation field, sand filters, or otherwise.

If the week-end house is not provided with a general water supply system the amount of waste water from washing and cooking can be disposed of in a small cesspool roughly constructed of loose stone or timber and covered tightly to prevent fly and mosquito propagation. Wash water should not be thrown on the ground because the soap and suspended organic matter in it in time will become a breeding place for flies.

Where a general water supply system is not available the human excreta can be disposed of either by a dug privy, a removable container, or a chemical toilet. These toilets should be removed from the main structure taking into consideration prevailing winds and privacy. They should be amply ventilated, light, and easily cleaned, screened with metal wire or mosquito netting.

REFUSE DISPOSAL

Most rubbish can be disposed of by burning. Incombustible rubbish should be buried. Garbage should be stored in such a way that odors are not produced and so that flies and vermin are not allowed to have access to the material. The garbage can should be located near the kitchen, placed on a rack or storage platform that will permit the ground in the immediate vicinity to be covered with lime to prevent spilled garbage from decomposing and attracting flies. The garbage cans should be constructed of substantial material and fitted with tight covers. Garbage should be disposed of by burning or burying. Economical small-size incinerators may be made of "salamanders." The incinerators should not be located near the house.

COLOR

Pigment color should be reduced to a minimum on account of the cost of maintenance.

The colors should be organized:

1. *To increase the cheerfulness, comfort and the appeal of the structure* (counterpoint to the gray drabness of the city). Use of warm and cool colors in relation to the sunlight. Light and heat reflecting surfaces.
2. *To increase the ease and safety of operation.* Primary colors are easily recognized. Doors, stairs, equipment, etc., should be clearly indicated in space.











Interior views of the week-end house shown on page 187. Note the use of wall bed.

ERNST PIETRUSKY, Architect

3. *To increase the ease of maintenance and cleaning and to facilitate the clean appearance of the structure.* Enclosed spaces should have colors that will make the presence of dirt easily detected. Exterior parts that are unavoidably soiled should be dark.
4. *To increase the visual unity.* The number of colors should be limited to a minimum.

PLASTIC UNITY WITH SURROUNDINGS

Primary forms and colors are right in any surroundings. The plastic unity of the structure with the natural setting is determined by the clear statement of the specific problem and by the solution of this problem with rational human tools.

Any attempt to conceal the nature of the structure as a human creation through a superficial imitation of "natural" forms (fake log cabins), or a *sentimental*—and often expensive—use of local materials and building forms is as misplaced as the *intrusion* on nature by representative forms. The week-end house is no intrusion. It is the setting for a life in friendly contact with nature. A structure that is determined by unselfish human relations to sun, soil and surroundings, and by the use of human industrial methods is a natural circumstance, as native as the nests of birds and insects, the bridge, the highway and the sailboat.

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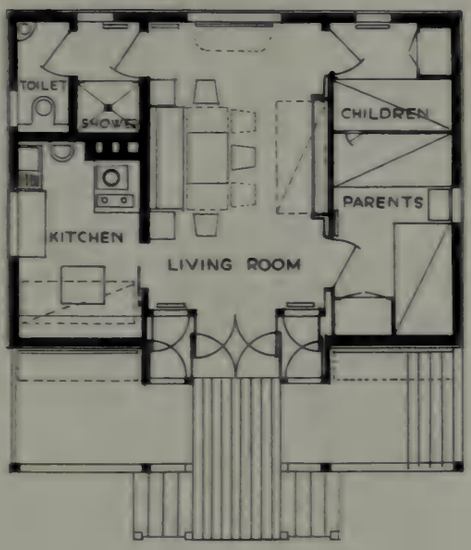
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Pacific and Atlantic







WEEK-END HOUSES IN SILESIA
ERNST PIETRUSKY, Architect

The group is built by a government association and furnished with household utensils. The lower hall in the administration building serves as meeting hall for social purposes. Gas, water, electricity. Brick foundations. Wooden framework with bricks. The weather sides, exterior corkslabs lined with planks. Colored roofing felt. Bright colors: vermilion, caput mortum; windows painted white, doors green.





"OCATILLA" DESERT CAMP FOR FRANK LLOYD WRIGHT, ARIZONA

DESERT CAMP FOR FRANK LLOYD WRIGHT
ARIZONA
FRANK LLOYD WRIGHT, ARCHITECT



PURPOSE

Dwelling, office, and drafting room for the architect during the preparation of plans for a desert development.

LAYOUT

Dwelling, guest house, office, drafting room, bunk-shelters for the draftsmen, dining room, kitchen, cook's shelter, and shelter for cars are grouped together about a low outcropping of rock that rises between, giving privacy to all. Each group has its own bath and privy. The buildings are connected with a low box-board wall inclosing the stony hill-crown as a court.

CONSTRUCTION

Box-boards 11½" wide, battens 1¾ x ⅞", 10 oz. canvas 4'–0" wide put together with nails, screws, hinges, and ship cord on 4'–0" units. The canvas awning-windows and doors may be shut against the dust or may be open to deflect the desert breeze in to the interiors. Cross ventilation is everywhere at the floor-levels to be used in the heat of the day. The long side of the canvas slopes lies to the sun to aid in warming the interiors in the winter. This is to have an additional cover of canvas, ventilation between, in summer, if occupied then. The translucent canvas tops afford generous diffusion of light within.

EQUIPMENT

Air tight sheet-iron stoves in each shelter keep the inside warm in winter after sundown. Lighting by a KOHLER plant.

COLOR

The box-boards are painted dry-rose. The canvas triangles of the gables are scarlet. The canvas is white.





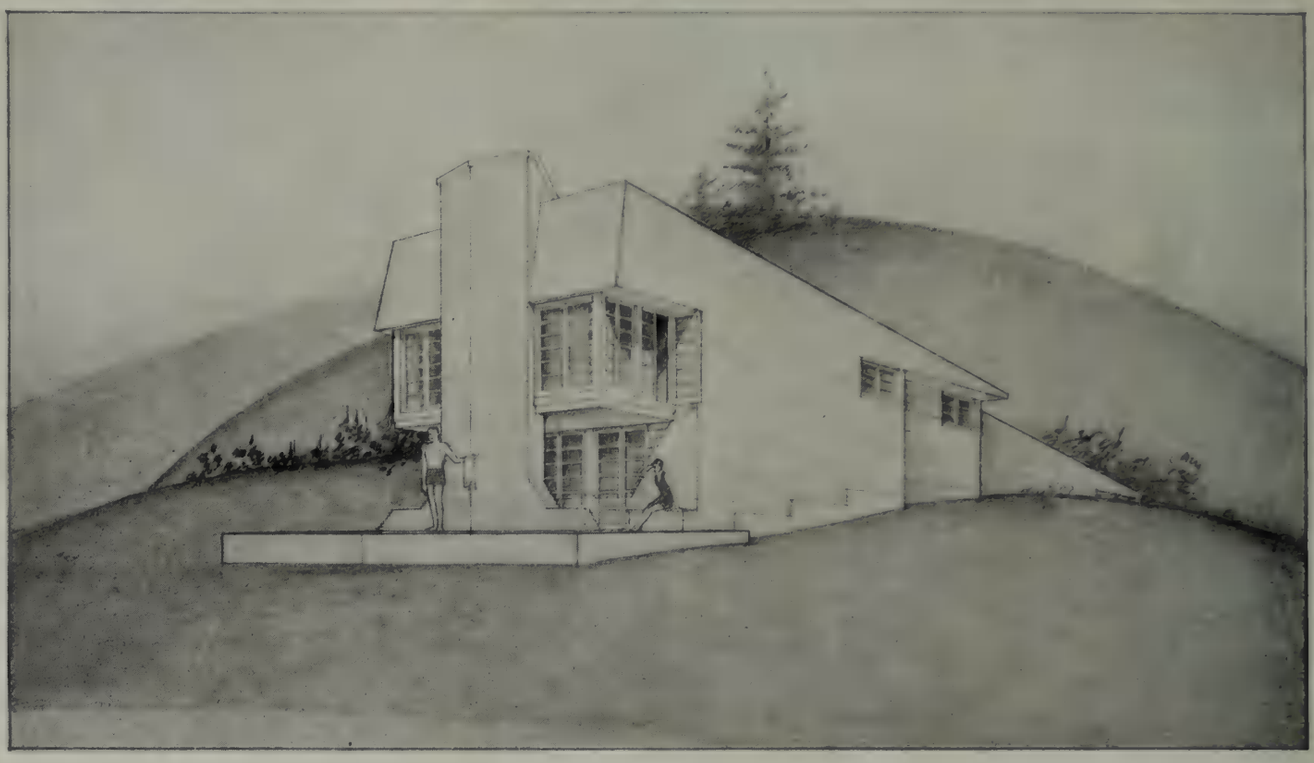
DESERT CAMP, ARIZONA

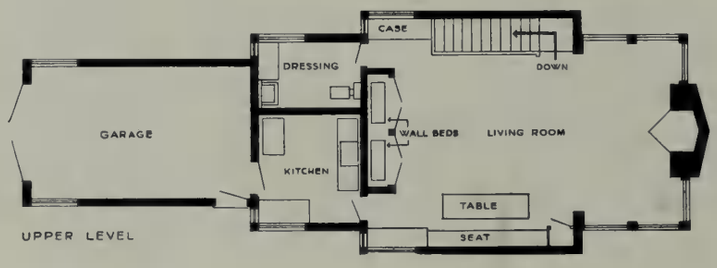
FRANK LLOYD WRIGHT,
Architect

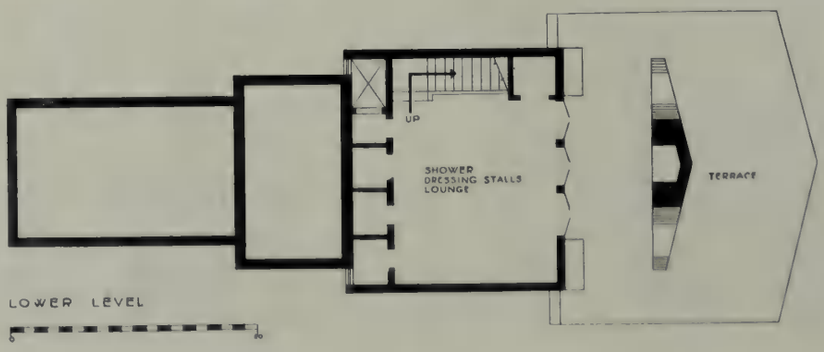




The canvas awning-windows and doors may be shut against the dust or may be open to deflect the desert breeze into the interiors.







BARRY BYRNE, ARCHITECT
DESIGN FOR OWN DUNE COTTAGE
LONG BEACH, INDIANA

Exterior: Wide bevel siding, sawnface, over studs sheathed with celotex. Studs exposed on interior. Wood surfaces stained light sand color. Sash orange red. Brick light orange red.





S.S. "President McKinley" of the American Mail fleet. At right: Luxurious stateroom aboard a President liner, typical of the handsome Barreled-Sunlight-painted interiors on all American Mail vessels.

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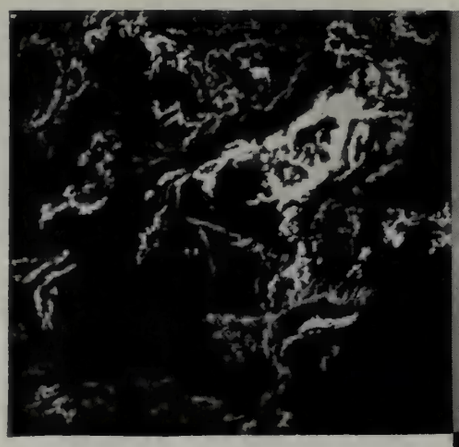
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SINCE most halls are not large enough for elaborate furniture groupings, decorative interest centers on walls and floor. Wall paper in hunting scenes, red taffeta curtains, and embossed linoleum in black and cream marbleized squares, make a striking background.

WE should like to send you an "idea book" on the use of linoleum in modern interior decoration. It contains a wealth of suggestions beautifully visualized, in full color. The illustration reproduced above is one of many covering the more important rooms of the home.

You will also find carefully made color plates of 52 smart linoleum patterns—beautiful examples of the progress that has been made in modern linoleum design.

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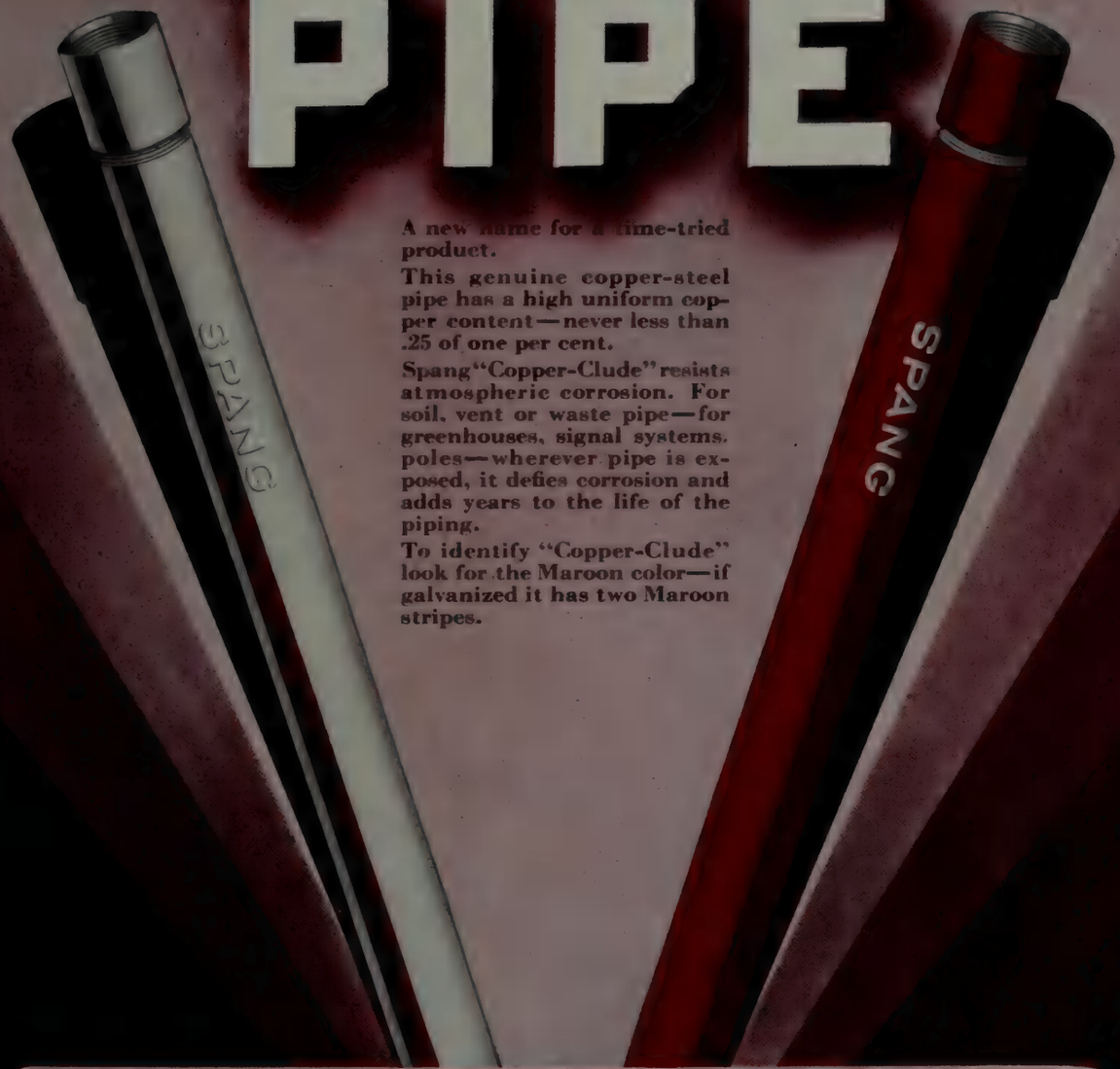
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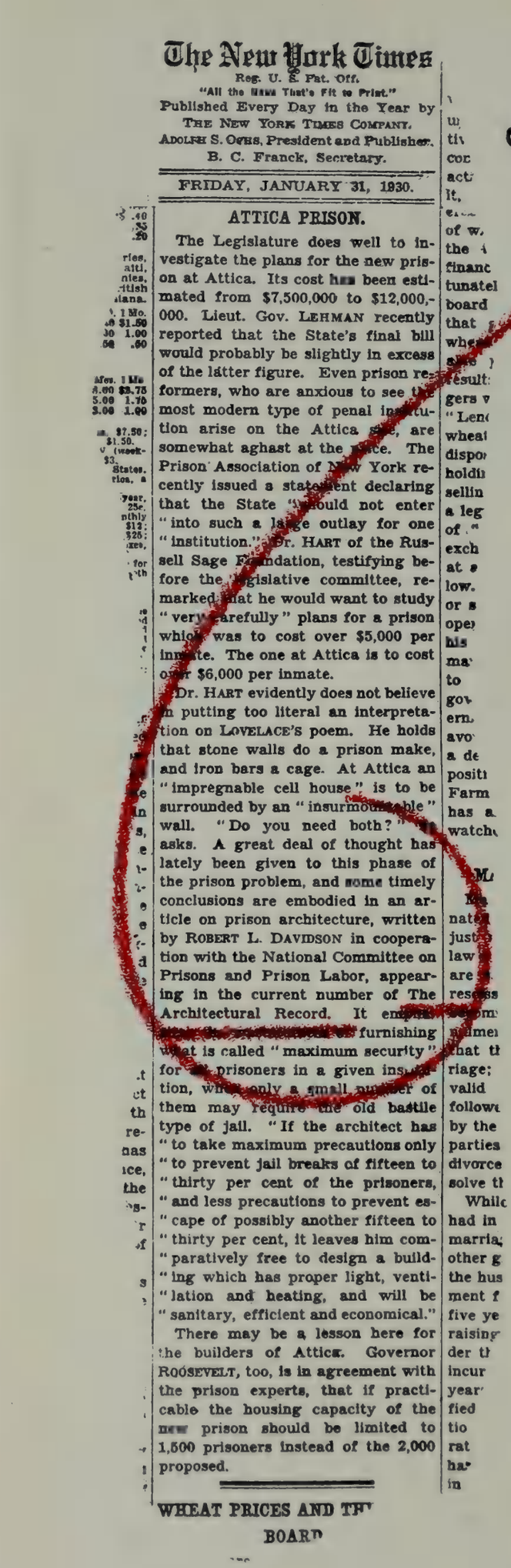
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FRIDAY, JANUARY 31, 1930.

ATTICA PRISON.

The Legislature does well to investigate the plans for the new prison at Attica. Its cost has been estimated from $7,500,000 to $12,000,000. Lieut. Gov. LEHMAN recently reported that the State's final bill would probably be slightly in excess of the latter figure. Even prison reformers, who are anxious to see the most modern type of penal institution arise on the Attica site, are somewhat aghast at the price. The Prison Association of New York recently issued a statement declaring that the State "should not enter "into such a large outlay for one "institution." Dr. HART of the Russell Sage Foundation, testifying before the legislative committee, remarked that he would want to study "very carefully" plans for a prison which was to cost over $5,000 per inmate. The one at Attica is to cost over $6,000 per inmate.

Dr. HART evidently does not believe in putting too literal an interpretation on LOVELACE'S poem. He holds that stone walls do a prison make, and iron bars a cage. At Attica an "impregnable cell house" is to be surrounded by an "insurmountable" wall. "Do you need both?" he asks. A great deal of thought has lately been given to this phase of the prison problem, and some timely conclusions are embodied in an article on prison architecture, written by ROBERT L. DAVIDSON in cooperation with the National Committee on Prisons and Prison Labor, appearing in the current number of The Architectural Record. It emphasizes the [illegible] of furnishing what is called "maximum security" for all prisoners in a given institution, when only a small number of them may require the old bastile type of jail. "If the architect has "to take maximum precautions only "to prevent jail breaks of fifteen to "thirty per cent of the prisoners, "and less precautions to prevent es- "cape of possibly another fifteen to "thirty per cent, it leaves him com- "paratively free to design a build- "ing which has proper light, venti- "lation and heating, and will be "sanitary, efficient and economical."

There may be a lesson here for the builders of Attica. Governor ROOSEVELT, too, is in agreement with the prison experts, that if practicable the housing capacity of the new prison should be limited to 1,500 prisoners instead of the 2,000 proposed.

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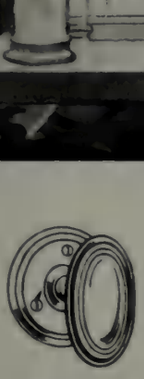
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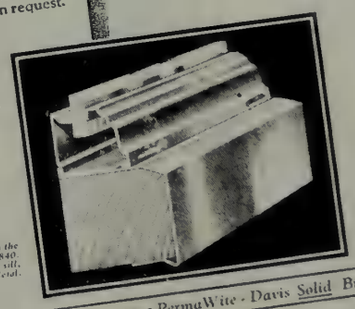
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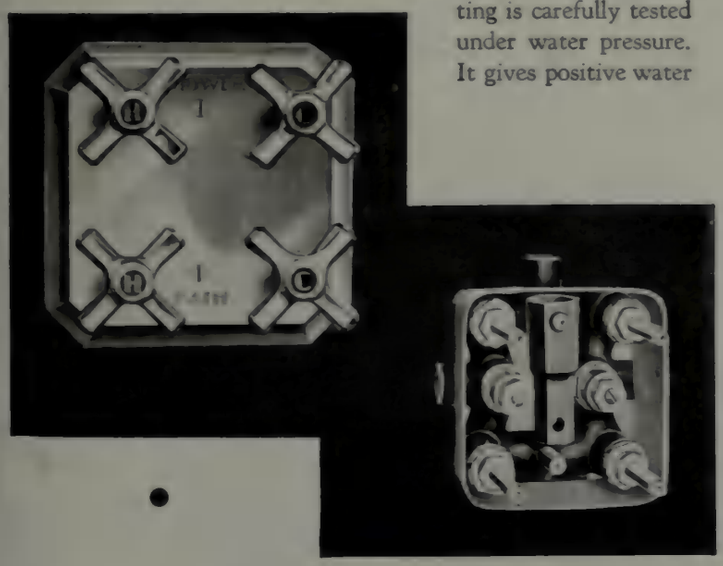
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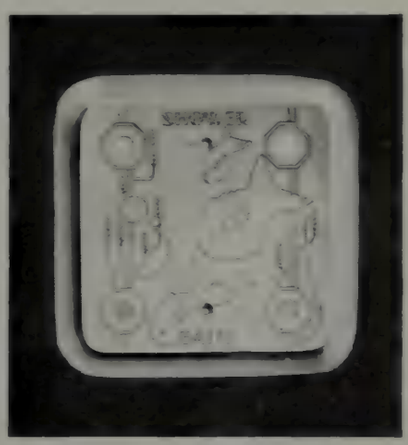
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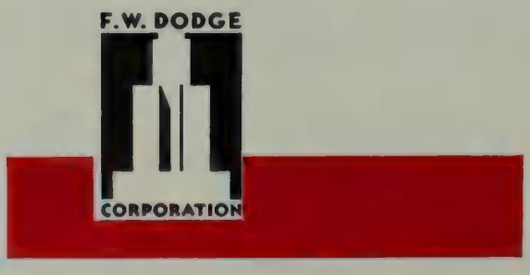
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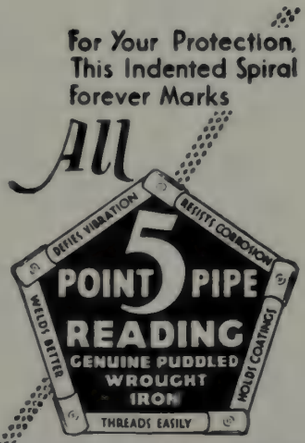
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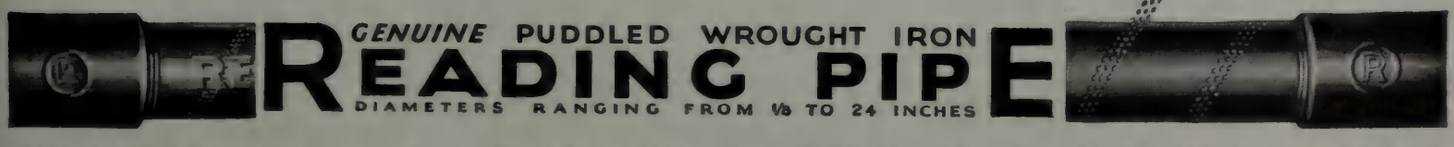
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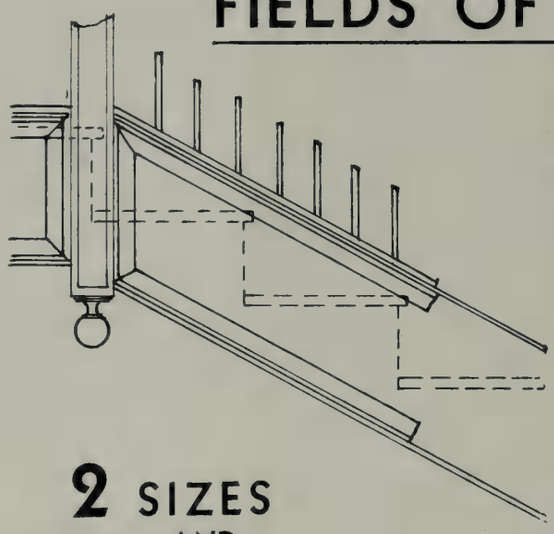
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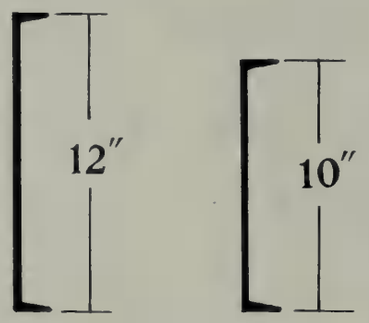
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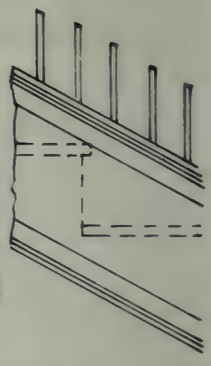
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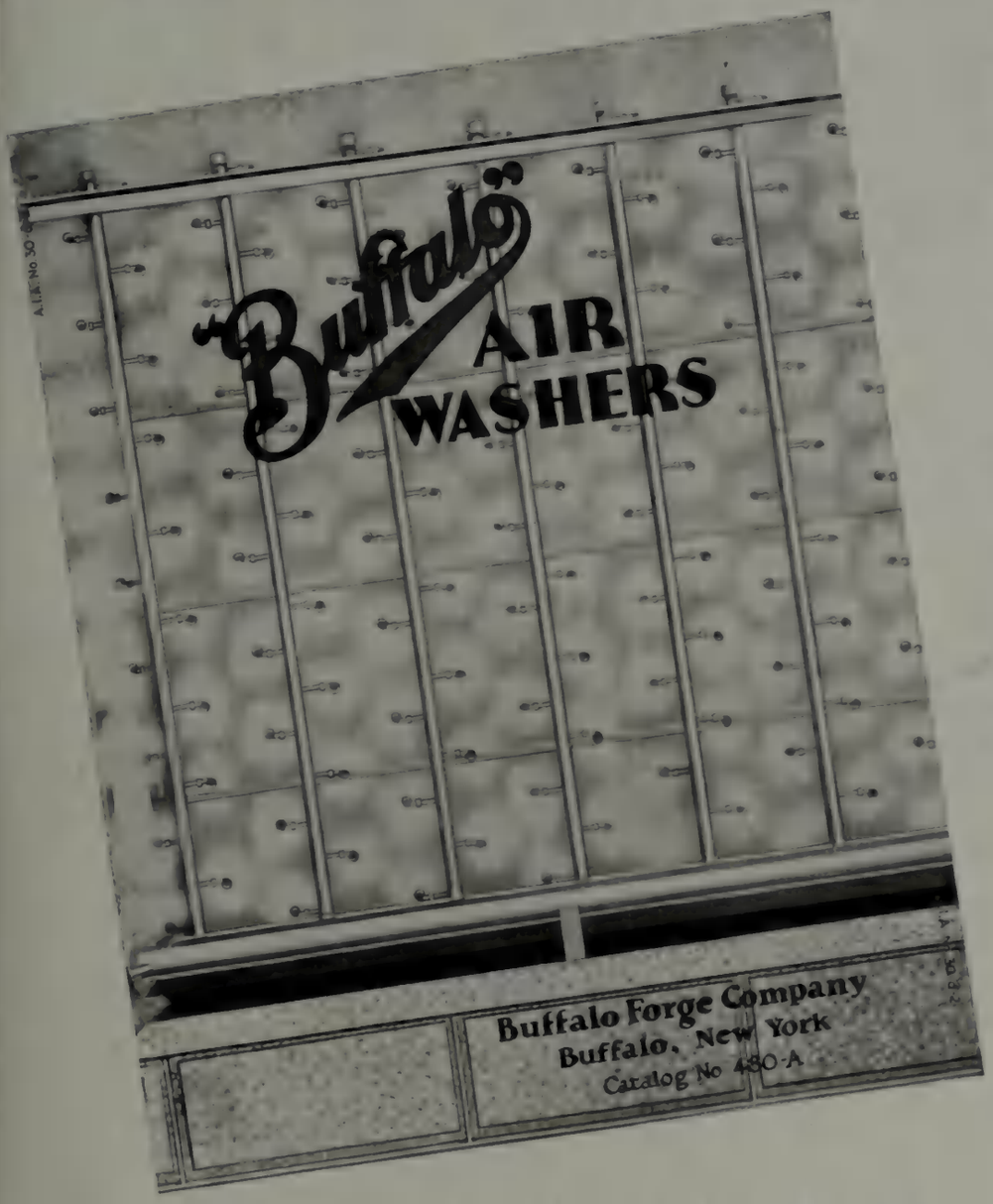
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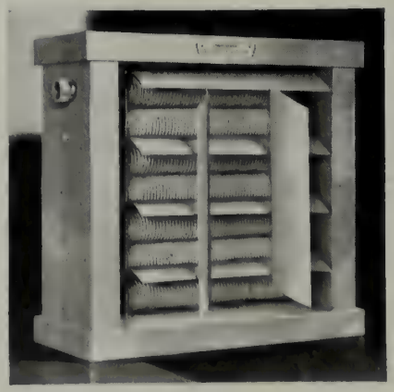


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Leading architects the country over know from experience that a Youngstown pipe installation is sound insurance of pipe permanence. Time and performance have proved that this sturdy steel pipe insures a plumbing, heating or sprinkler system installation that will endure. Thousands of notable buildings from coast to coast are demonstrating this lasting performance.

To be sure of a lasting pipe installation, specify Youngstown!

THE
YOUNGSTOWN SHEET AND TUBE COMPANY

One of the oldest manufacturers of copper-steel, under the well-known and established trade name "Copperoid"

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ST. LOUIS—525 Louderman Bldg.
YOUNGSTOWN—Stambaugh Bldg.

LONDON REPRESENTATIVE
The Youngstown Steel Products Co., Dashwood House, Old Broad St., London, E. C. England

YOUNGSTOWN

GALVANIZED SHEETS PROTECT ∴ ∴ ∴ ∴ ∴ SAVE WITH STEEL



Architects-Engineers
Smith, Hinchman & Grylls

Heating & Ventilating
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Fan System Apparatus
American Blower Corp.

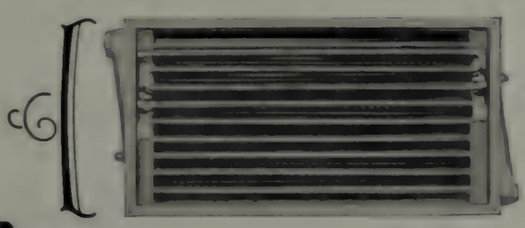
Air Conditioning
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AEROFIN *is the* Heat-Surface

TOWERING six hundred sixty-five feet above the Street, the magnificent new Penobscot Building dominates Detroit's rapidly rising skyline. And, of course, AEROFIN is the Heat-Surface,—in the Building itself and as a part of the Air Conditioning Equipment which assures comfort and health in the Guardian Detroit Bank, occupying the lower floors.

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Notice the quiet, smooth operation of the Westinghouse Elevators.

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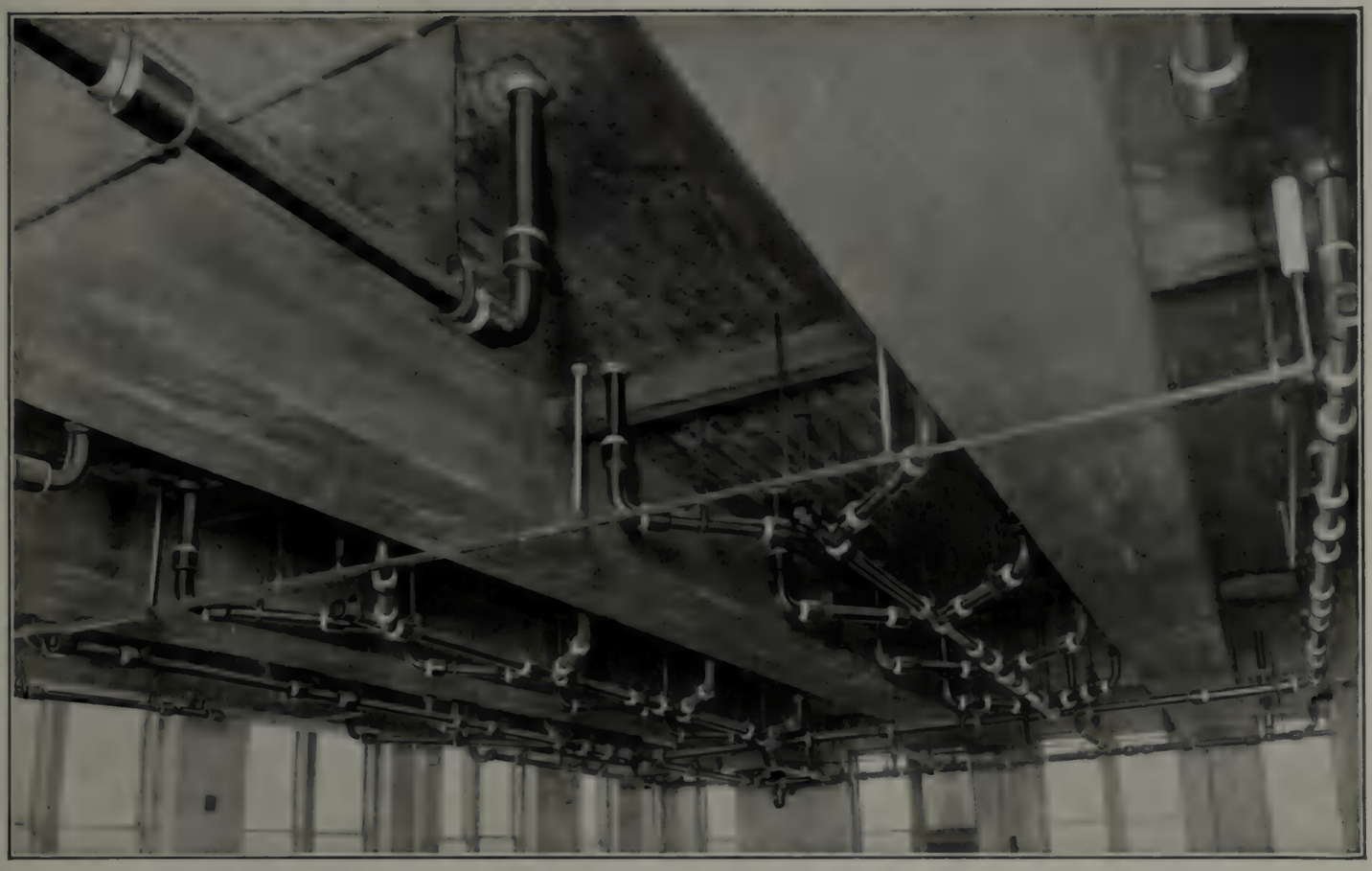
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Westinghouse Elevators—One of the features of excellence and a high standard characteristic of the McGraw-Hill Building throughout.

Westinghouse Elevators are the logical highways of modern architecture

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ELEVATORS



KNIGHT-WARE Waste Lines in Columbia Presbyterian Hospital Centre
The above photo was taken in the 10th floor laboratory and shows quite clearly the method of hanging KNIGHT-WARE Pipe and Fittings. There were 96 Outlets on this floor. KNIGHT-WARE was used exclusively in this structure for all Acid Proof Waste and Ventilating Lines.



Figure 235
Acid Proof Laboratory Sink with Back

We manufacture any and all designs of Acid Proof Laboratory Sinks, Acid Sumps and Catch Basins, Ventilating Flue Caps and any acid proof equipment for the building.

This equipment can be made to your exact specifications or we will gladly make such suggestions as will best suit your needs.

Safe from Attack by Corrosives

KNIGHT-WARE Acid Proof Chemical Stoneware Waste, Drain and Ventilating Lines installed into your building is permanent insurance against attack by acids or corrosives so long as the building shall stand.

Further, KNIGHT-WARE is not expensive; in fact costs less than many other so-called acid resisting materials. It is easily and economically installed, only one hanger being required per length of pipe or fitting. Joints are readily made that are acid proof and will stand far in excess of any pressure they will ever be called upon to withstand.

Experience and knowledge derived from our many KNIGHT-WARE installations is yours for the asking. May we be of service?

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OFFICE AND PLANT—AKRON, OHIO

GUARANTEED SATISFACTORY — MAURICE A. KNIGHT — ACID-PROOF CHEMICAL STONEWARE
KNIGHT-WARE
"IT IS THE CHEMICAL BODY ITSELF"

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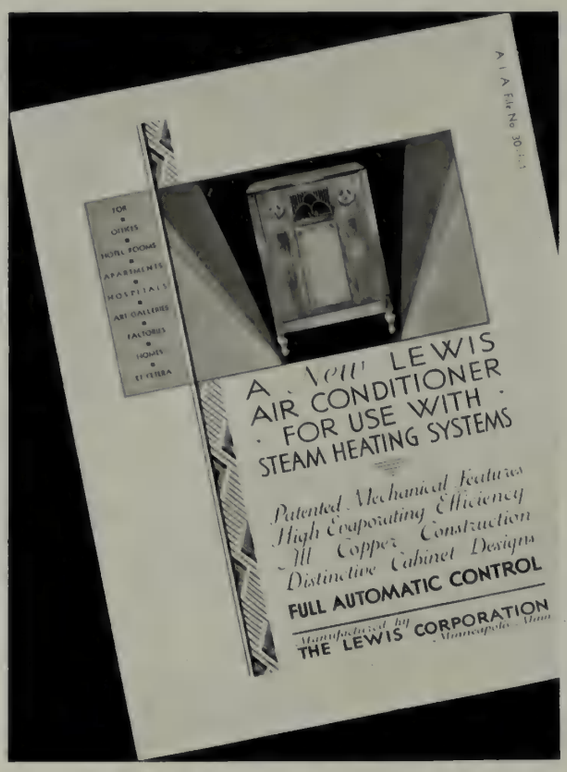
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A NON-MOTORIZED LEWIS AIR CONDITIONER WITH AUTOMATIC CONTROL!!



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DESCRIBES THIS
IMMENSE ADVANCE
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Operating without a motor (but for use with steam heating systems only) this new Lewis Air Conditioner under normal conditions maintains any desired relative humidity up to 60% in space not exceeding 15,000 cubic feet • Equally important as the unique way this humidity is produced is the method by which it is controlled • You simply set the patented Lewis Humitrol (looks like a thermostat - acts like one) for the relative humidity you desire • That's all there is to do • The Humitrol is the master control over the operation of the air conditioner • When there is a demand for moisture, the unit goes into operation • When the humidity builds up to the desired point, the unit shuts off automatically • Because of the accurateness of the Humitrol, there is never an excess amount of moisture to do damage • Air is washed free from dust and dirt—recirculation is assisted • Literature descriptive of both motorized and non-motorized Lewis Air Conditioners, together with our booklet "Controlled Humidity and Human Comfort" will be sent upon request • The Lewis Corporation, Minneapolis, Minn.

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Plans and Specifications by
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EXTERIOR LIGHTING FIXTURES

by

SMYSER-ROYER

A·L·E·A

Architects who recommend only the best materials for the buildings they design, invariably specify Smyser-Royer Exterior Lighting Fixtures.

Two hundred Smyser-Royer standard designs are shown in Sweet's Catalogue; Section D, pages 5334 to 5344.

When an original design is required, Smyser-Royer craftsmen can be depended upon to reproduce it faithfully in iron, bronze or aluminum.

SMYSER-ROYER COMPANY, *Main Office and Works, York, Pa.*
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THE NEW *FLATNESS* IS THE SECRET

GLASS that does not distort your view with crinkly outlines—nor block your vision with streaks and waves. And you only have to look AT this new window glass, as well as THROUGH it, to see there's a *reason* for this new, clearer visibility.

Pennvernon is *flat*. Both sides, alike, are noticeably free from the curves, waves and other imperfections that have always belonged to window glass. Both sides are brilliantly surfaced—brighter than any fire-finished glass of the past. The glazier finds his work immeasurably lightened... and the user gets a flatter, brighter glass which costs no more than ordinary glass.

Pennvernon is obtainable through warehouses of the Pittsburgh Plate Glass Company in every leading city. Read *why* this window glass is so different—in the new Pennvernon booklet, which will be mailed you on request. Write for your copy today. Address Pittsburgh Plate Glass Company, Pittsburgh, Pa.

PENNVERNON
flat drawn
WINDOW GLASS



Magnificence at its Height



THE new Waldorf-Astoria is truly "magnificence at its height". Arising from traditions rich in association with famed personages from all countries of the globe . . . this renowned hostelry achieves new splendor in size, decoration and equipment. Infinitely more commodious than its predecessor whose name it bears, the magnificent new Waldorf-Astoria is planned to be the center of hospitality for a modern world.

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America's Standard Wrought Pipe

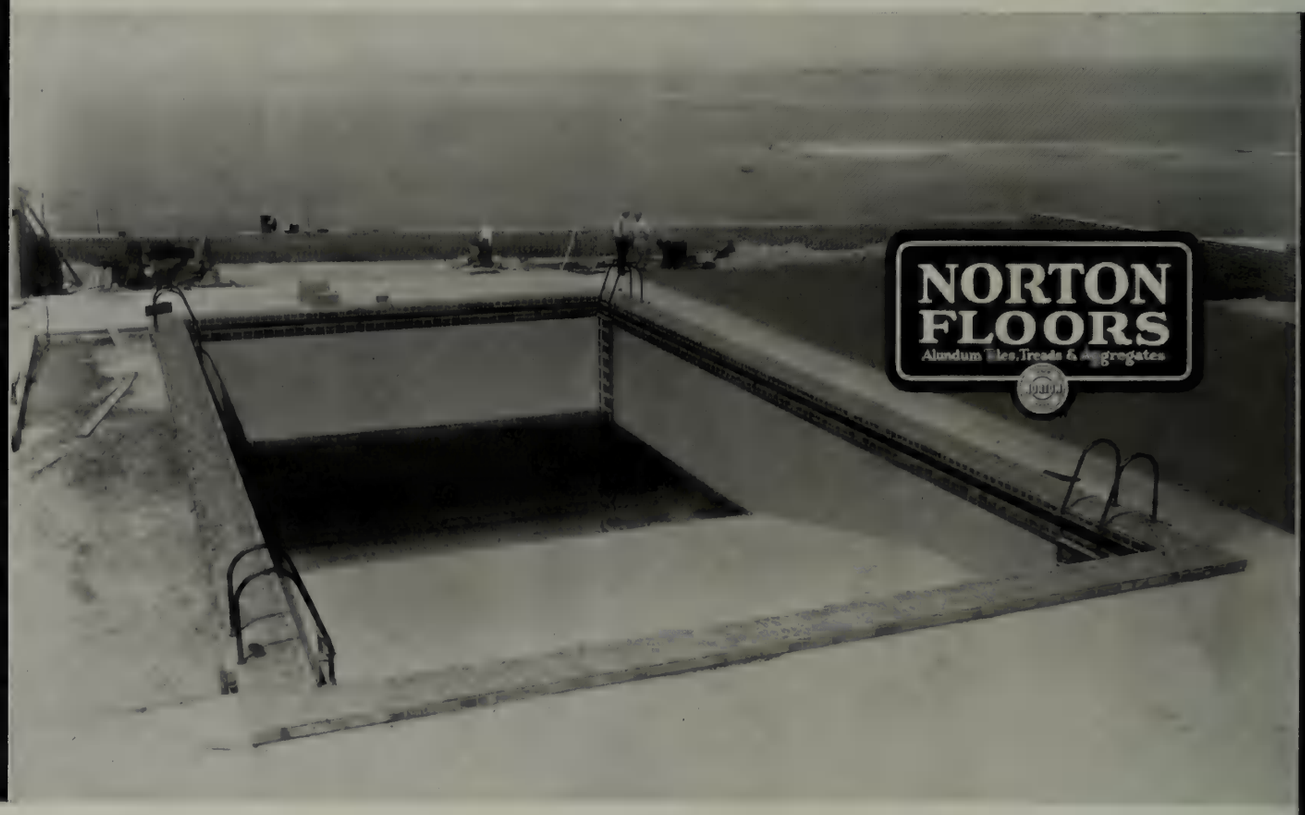
The New
WALDORF-ASTORIA
New York City

Architect: Schultze & Weaver
Consulting Engineer: Clyde R. Place
General Contractor: Thompson-Starrett Co.
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NATIONAL PIPE

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
SUBSIDIARY OF UNITED STATES STEEL CORPORATION

The Bottom of this Pool is *truly Non-Slip*



● NON-SWIMMERS can sport in the wading end of this Florida pool without fear of slipping and going under water. The Alundum Tile floor assures a safe, firm footing . . . even on the steep slope leading to the deep end of the pool. ¶ There are many places such as this for which Norton Floors are especially suitable because water and other liquids do not lessen their non-slip effectiveness. Both large units [Alundum Floor and Stair Tile] and small units [Alundum Ceramic Mosaic Tile] are available in a variety of colors and sizes. « « « « «



Roebling Swimming Pool, Clearwater, Florida
Architect: R. W. Wakeling, Clearwater
Tile Contractor: Stewart-Mellon Marble & Tile Co., Tampa, Florida

T-263

NORTON COMPANY, WORCESTER, MASS.

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of HOUSING COMPANY
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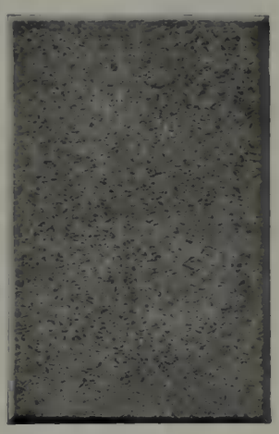
Acoustex erectors are located in principal cities . . . Ask for specifications and details on the use and application of Acoustex . . . or write us direct.

ACOUSTEX

The *Decorative* Sound Absorbent

ACOUSTEX offers you . . .

An acoustic material which is a finish beautiful in itself . . . tinted to your specifications . . . unusually high coefficient of sound absorption . . . easily vacuum cleaned and redecorated . . . made of incombustible wood fibre . . . tested through years of successful installations . . . furnished in tiles from 6″ x 12″ to 12″ x 24″ and large sheets two feet wide and up to ten feet in length . . . three thicknesses available to meet all absorption requirements:



ACOUSTEX 60—1 inch thick
*Absorbs more than 60% of the incident sound

ACOUSTEX 70—1½ inches thick
*Absorbs more than 70% of the incident sound

ACOUSTEX 80—2 inches thick
*Absorbs more than 80% of the incident sound

*1024 vibrations per second.

Boston Acoustical Engineering Division of Housing Company, 40 Central St., Boston, Mass. R-8
Please send Specifications and Details on the Use and Application of Acoustex for our acoustic file.

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Something New . . . Reliable Gas Ranges now built to individual specifications for finest residential and apartment homes. ▪ ▪ These famous stoves have rigid framework of unbreakable Angliron, finished in durable, sparkling chromium that will not stain or tarnish. Hand-fitted construction by master craftsmen. Neither time nor service can injure the brilliant beauty of these magnificent gas ranges. ▪ ▪ Special designs of Reliable Custom-Built Gas Ranges will be created to meet any space- or service-requirements. Blueprints submitted for approval. Many installations now giving exceptional satisfaction. Correspondence invited from those who seek individuality, permanent beauty and a complete and faultless cooking service.

Write for catalog "Custom-Built Gas Ranges"



It Is a GOOD Gas Range That Has This Red Wheel

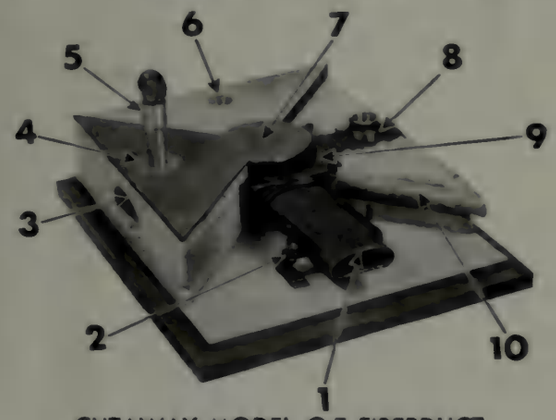
AMERICAN STOVE COMPANY • DEPT. B, 555 CHOUTEAU AVENUE, ST. LOUIS, MO.

Largest Makers of Gas Ranges in the World

G-E FIBERDUCT



For Today's Wiring *and* TOMORROW'S



CUTAWAY MODEL G-E FIBERDUCT AND FITTINGS

1. G-E Fiberduct.
2. Coupling-support with leveling screws.
3. Oval crown 1 in. below surface molds strong concrete arch.
4. Brass floor flange flush with linoleum.
5. Lighting outlet, brass standpipe, bakelite head.
6. Brass insert; grouted—can't pull out.
7. Adjustable-height cover recessed for linoleum.
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9. Heavy, one-piece iron junction box with leveling screws.
10. Conduit for feeder lines.

You can plan underfloor wiring today that will be adequate down the years if G-E Fiberduct—the *modern* fiber raceway—goes into concrete floors.

Locate outlets *anywhere* in a G-E Fiberduct system. More can be added *any time* merely by boring into the duct. Abandon old ones with brass plugs.

G-E Fiberduct's flat-oval cross-section gives it maximum wire carrying capacity in least space . . . molds a strong concrete arch over itself.

It is readily installed in single or multiple duct systems. Economical . . . non-corrodible.

You can obtain it promptly, anywhere, from G-E Distributors' stocks. General Electric guarantees it.

For further information, please write Section C-158, Merchandise Dept., General Electric Co., Bridgeport, Conn.

GENERAL ELECTRIC

▲ FIBERDUCT AN ELEMENT OF THE G-E WIRING SYSTEM ▲

MERCHANDISE DEPARTMENT GENERAL ELECTRIC COMPANY BRIDGEPORT, CONNECTICUT

DARKNESS

casts a shadow on the

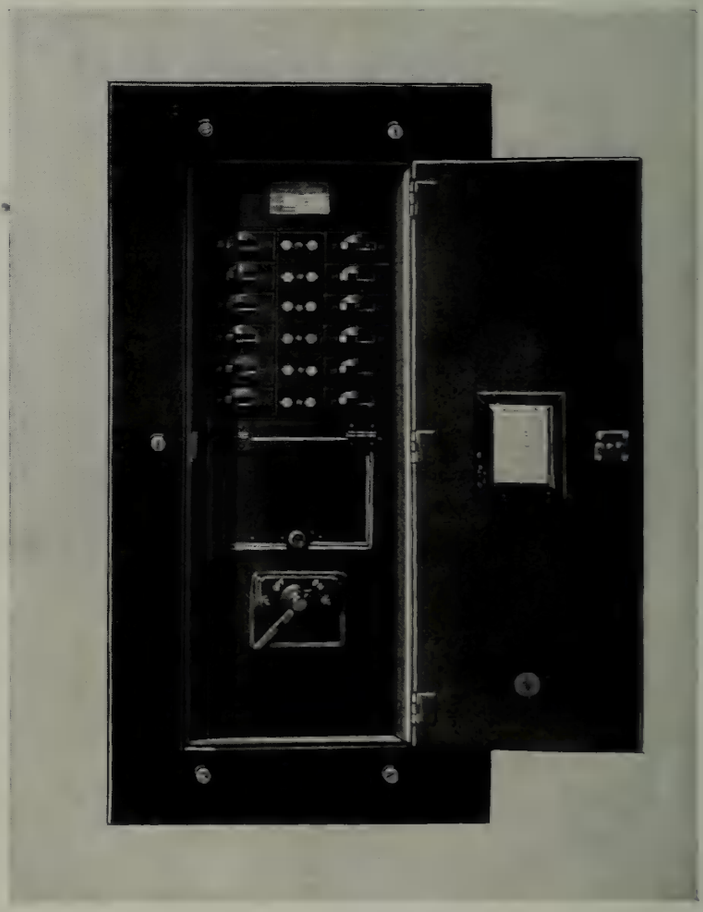
PROFIT SHEET

HUMMING motors . . . busy machines . . . hurrying workers . . . straining to the limit to meet the production schedule. A blown fuse . . . sudden darkness . . . and production stops until an electrician can restore service.

Although these lighting outages cannot be avoided if the wiring is to be protected, they can be reduced to the minimum . . . in duration and in frequency . . . by installing Westinghouse Nofuz panelboards in every class of building.

The nearest worker can restore service by a flip of the breaker handle . . . it is not necessary to await the arrival of an electrician from some important task to replace a blown fuse. Further, the breaker does not open the circuit on momentary overloads . . . but it does protect fully the wiring and equipment at all times. The time saved in the reduction of service outages will lessen the shadow on the profit sheet.

A Westinghouse panelboard specialist will show you a sample Nofuz breaker and explain its advantages upon request.



12 Circuit Nofuz panelboard showing circuit-breakers in the branch circuits.

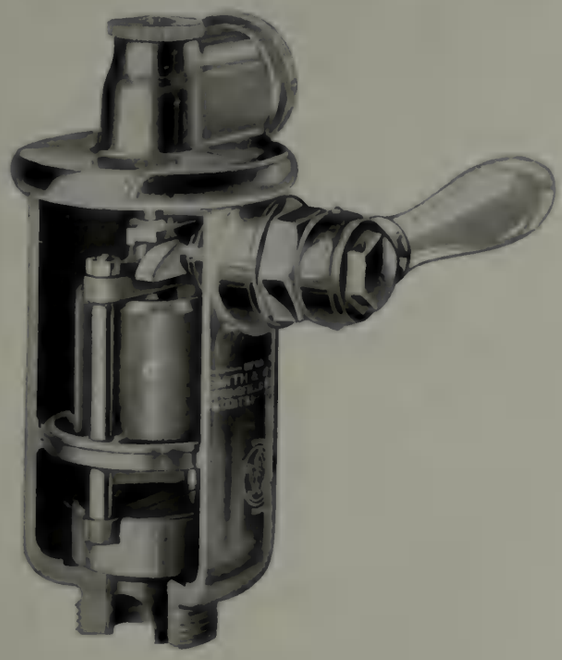
Service, prompt and efficient, by a coast-to-coast chain of well-equipped shops

Westinghouse

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A further reason for lasting, *attention-free* service from the SMITH & WESSON Flush Valve

The operation cycle may be readily understood from the illustrations, which show the valve open and closed. The valve is opened by depressing the handle. The volume of water is controlled by the hydraulic governor which also controls the closing of the valve. With *any* adjustment, the valve is fully opened.

The closing action is aided by gravity and is not dependent on the water flow. In fact, the valve will complete its operation cycle without water, excellent proof of its good design.

For Further Information Write

SMITH & WESSON

FLUSH VALVE DIVISION

SPRINGFIELD, MASSACHUSETTS



IDEAL GAS BOILERS

give owners basements like these . .

■ Homes can be really modernized when Ideal Gas Boilers are installed. The basement can be turned into additional living quarters that are clean and comfortable. The illustrations on this page will give you some idea of how owners are transforming their basements with the help of Ideal Gas Boilers.

■ Ideal Gas Boilers burn noiselessly, cleanly, efficiently and automatically. They require no fuel storage or handling. The fuel comes from the same inconspicuous pipe as the fuel for the gas range. They require no ash removal. The fuel is entirely consumed without soot or dirt.





■ These features which insure healthful even temperature throughout the house—with luxurious freedom from care—which give livable additional space for den, workshop or playroom, appeal to every home owner who is planning to modernize and to everyone who is planning to build or buy.

■ We'll be glad to tell you more about this modern equipment if you will write us.

Manufactured by

AMERICAN RADIATOR COMPANY

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CHRYSLER BUILDING, NEW YORK

ALUMINUM PAINT— THE COAT OF METAL PROTECTION



THE foundation must be right if a building is to be right. The foundation of a painting job is the priming coat. Top coats can't look right and stay right unless the primer does its work well.

The purpose of the primer on wood is to check rapid change of moisture content. By priming *both* sides of lumber with aluminum paint you minimize moisture change and the possibility of warping and checking. As a result the top paint coats are not stretched and broken. Paint does its work well—it protects, as it should, the fine lines of architectural detail.

FINISH COATS CAN'T STAND UP IF THE PRIMER FALLS DOWN

Aluminum paint has distinctly superior moisture-proofing efficiency. Because it has a pigment of pure aluminum, it forms a *coat of metal protection*. It is this metal protection that keeps moisture content within safe limits.

ALCOA ALUMINUM ALBRON

Aluminum Company of America does not sell paint. But aluminum paint made with satisfactory vehicles and Alcoa Albron Powder may be purchased from most reputable paint manufacturers, jobbers and dealers. Be sure the pigment portion is Alcoa Albron and is so designated.

Let us send you the booklet, "Aluminum Paint, the Coat of Metal Protection". Address ALUMINUM COMPANY *of* AMERICA; 2467 Oliver Building, PITTSBURGH, PA.

ALCOA ALBRON
POWDER FOR
ALUMINUM PAINT





Removing the Last Barrier to Perfect Sanitation

THE "Tepeco" line of Solid Porcelain and Vitreous China Urinal Stalls is made for single installations or in battery. The "Tepeco" method of interlocking stalls with separate seam covers does away entirely with the unsanitary space between stalls usually found in other installations.

Because of variations in height of urinals these seam covers are cut to fit each pair of stalls, and form clean, water-tight joints from wall to floor. This method also permits an easy and quick installation, the covers being placed in position after the stalls have been set. Single or in battery, the "Victory" stall is the perfect sanitary appointment for hotels, clubs and institutions.

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Trenton, New Jersey, U. S. A.

NATIONAL SHOWROOM
New York City, 101 Park Ave.
Entrance on 41st St.

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OUR GUARANTEE—We make but one grade of ware—the best that can be produced—and sell it at reasonable prices. We sell no seconds or culls. Our ware is guaranteed to be equal in quality and durability to any sanitary ware made in the world. The Te-pe-co trade-mark is found on all goods manufactured by us and is your guarantee that you have received that for which you have paid.

Every "Tepeco" Urinal Stall is trued and fitted by an expert stone cutter.



PLATE 3640-R

Showing 3-part battery of "Tepeco" Stalls. No catch corners for soil to collect.

TE-PE-CO

ALL-CLAY PLUMBING FIXTURES

Concrete Joist Floor Construction



New Union Industrial Bank Building
Flint, Michigan

Architects and Engineers:
Smith, Hinchman & Grylls

Contractor:
Realty Construction Company

Sets High Standard at Low Cost

THE wide acceptance of concrete joist floor construction among architects and engineers is significant of the economy in design, the reduction in dead load and the saving in time resulting from the high speed of construction attained.

Foremost in the field of pre-built forms for concrete joist floor construction are Meyer Steelforms—installed and removed by an organization that is equipped by experience to render the most effective cooperation to your superintendent and the contractor on the job.

CONCRETE ENGINEERING COMPANY

General Offices: Omaha, Nebraska

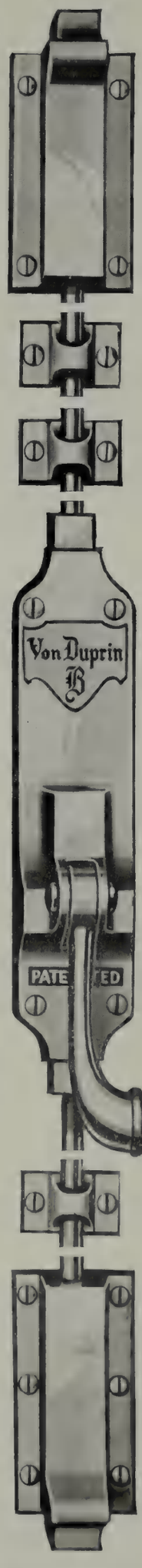
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MEYER *Steelforms*

THE STANDARD



THE ORIGINAL REMOVABLE STEELFORMS FOR CONCRETE JOIST FLOOR CONSTRUCTION



Von Duprin

Self-Releasing Fire and Panic Exit Latches

Painting the Lily - - Successfully

To improve upon the superfine has always been the dream of real craftsmen.

But opportunities come very rarely.

One came to us, however, when the new series genuine Type "B" Von Duprin devices were designed. By a happy inspiration—if we may use that phrase—we were able to radically cut down the number of parts and make the actuating members of the new design strong and long wearing beyond all precedent. The superlatively good was made even better.

To secure these better devices, we suggest that you specify them separately from the finishing hardware and, of course, by name. Thus you foster clean competition, since all reputable dealers can buy these devices at the same fair prices.

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Listed as Standard by Underwriters Laboratories



The Modernistic Movement

Plate 2

The Blackstone Shop is known as one of the most exclusive mercantile establishments on Michigan Boulevard, Chicago. The building itself—modern in design and flawless in craftsmanship—has brought additional distinction to the business. It was designed by Philip B. Maher and constructed largely of Neshobe Gray marble.

VERMONT MARBLE COMPANY—PROCTOR, VERMONT

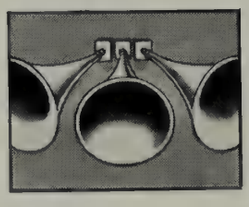
Branches in the larger cities

See Sweet's Catalog for Specifications and Other Data

VERMONT MARBLE



The Speech that Teamwork Built



Architect and Acoustic Engineer help speaker put it over...

The speaker rises. Every word he says carries — to every part of the room. People in the rear seats hear with front row ease.

Teamwork does it. Teamwork between the architect and an acoustic engineer in planning rooms where every person can hear, and in the proper installation of Public Address equipment.

The Western Electric Public Address System acts as a miniature interior broadcasting station. It widens the hearing circle, transmits speech, music and entertainment. It is included in specifications for schools, hotels, hospitals, clubs, auditoriums, and public buildings.

Western Electric acoustic engineers are always ready to consult with architects at the planning stage and at the stage of actual installation.

GRAYBAR ELECTRIC CO., AR-8-30
Graybar Building, New York, N. Y.

Gentlemen: Please send us the story of the Public Address System.

NAME

ADDRESS

CITY STATE

Western Electric

PUBLIC ADDRESS AND MUSIC REPRODUCTION SYSTEMS

Distributed by GRAYBAR *Electric Company*

AMERICA'S LARGEST CAPACITY FOR MAKING ENDURO

THE PERFECTED STAINLESS STEEL



Tapping a twenty-five ton Electric Furnace in one of the two modern plants in which Republic produces Enduro Nirosta KA2, the perfected Stainless Steel—under the original Krupp patents.

JUST two years ago Republic's alloy division first made Enduro Nirosta KA2 available to American industry. Even in this brief period, demand for this perfected stainless steel has become so widespread that Republic's capacity for its production, already the largest in the world, is now being still further increased.

Republic, with Enduro, provides the major portion of the stainless steel for radiators, lamps and other parts of motor cars, where permanent lustre is required.

Architects, engineers—builders of dairy machinery, food utensils, kitchen and hospital equipment—oil refiners—chemists—and scores of manufacturers in other industries, are finding Enduro's exceptional qualities wonderfully useful in countless ways.

The glittering tower of New York's mammoth Chrysler Building is sheathed in Enduro. Pilasters of the even taller new Empire State Building will be covered with this same fascinating alloy.

Enduro is stronger than carbon steel—impervious to rust, corrosion and the vicious attacks of most acids. Yet it is easy to work. The gleaming finish cannot wear thin or chip off because, unlike a plated surface, it is the same all the way through.

When polished, Enduro is as lustrous as the finest silver—and it will not tarnish.

A stainless metal with such remarkable properties will greatly increase the usefulness, appearance and profitable saleability of hundreds of products in hundreds of fields. Republic metallurgists will gladly work with any manufacturer in adapting Enduro to new needs and new uses.

REPUBLIC STEEL
CORPORATION

GENERAL OFFICES: YOUNGSTOWN, OHIO

Geo. B. Post & Sons Give Their

ENDOWED with a richness of heritage and tradition equalled by few architectural offices, the firm of Geo. B. Post & Sons has done a larger volume of work since the death of the founder than was done during his long brilliant career.



National Town and Country Club, Cleveland, one of the recent commissions of Geo. B. Post & Sons.

Mr. Post began the practice of architecture in 1860. His son, William S., joined him, after graduating from the School of Mines, Columbia University, Department of Architecture, in 1890. A second son, J. Otis, having studied at Columbia and at the Ecole des Beaux Arts, in Paris, entered the office in 1901. In 1904 the present firm was formed, and from that date until January first this year, when William S. Post, F.A.I.A., retired, the sons carried on. W. Sydney Wagner became a full partner in 1925 and resigned June 30, 1929. J. Otis Post is now in command and the business is as virile and prosperous as at any time in its history.

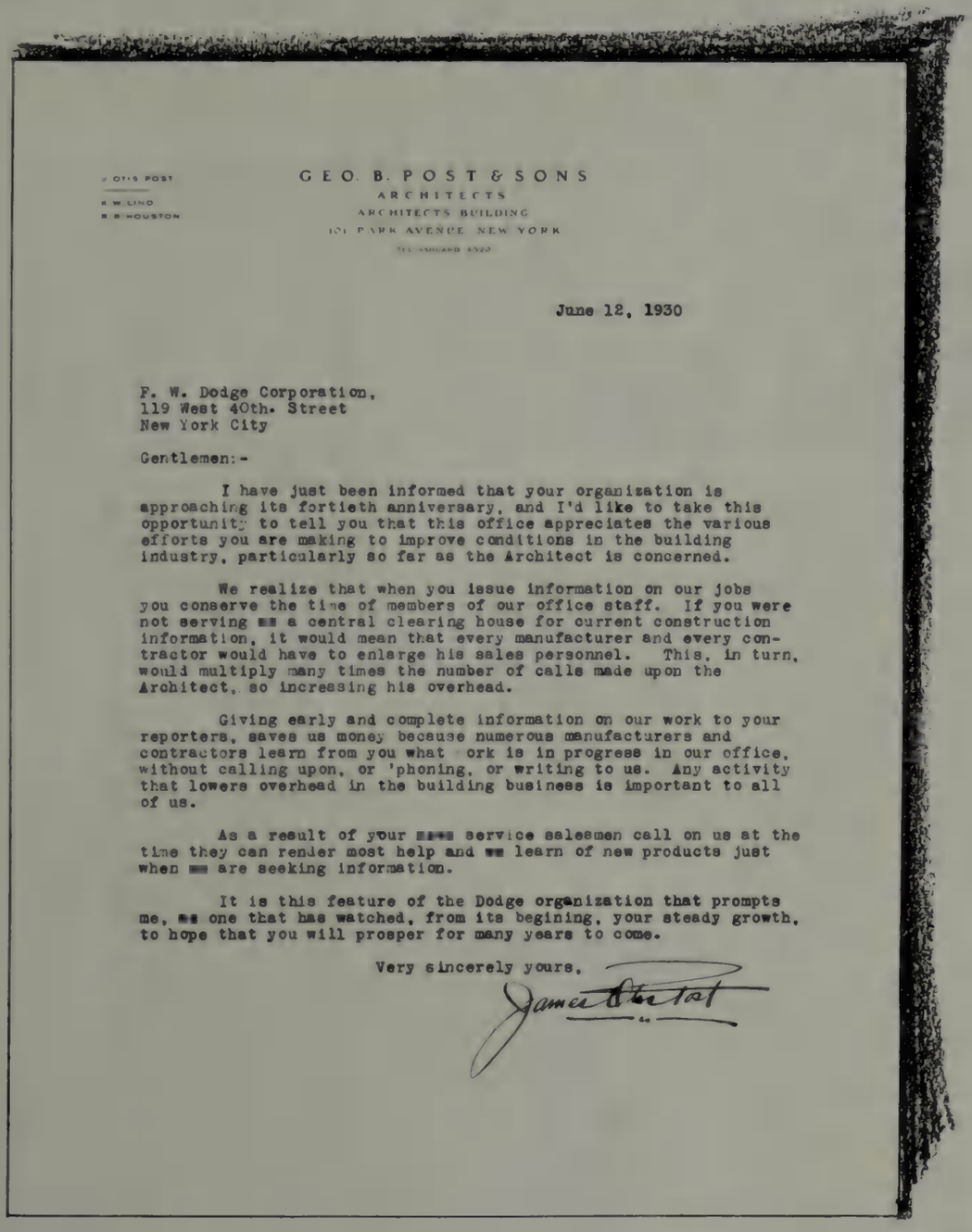
Mr. J. Otis Post, F.A.I.A., is a past President of the Beaux Arts Institute of Design and the Society of Beaux Arts Architects. He is a Member of the American Group, International Congress of Architects.

Among the large number of important projects handled by this office, the following are outstanding: New York City residence of Cornelius Vanderbilt, Manufacturers' and Liberal Arts Building, Chicago World's Fair, New York Produce Exchange, built in 1883 and still in use, St. Paul Building, Broadway and Ann Streets, New York's first (29 story) skyscraper, built in 1899, also still in use, Buildings of the College of the City of New York, to which the Vocational Building is now being added, New York Stock Exchange, Wisconsin State Capitol Building, Hotels Statler in Boston, Buffalo, Cleveland, Detroit, and St. Louis; Roosevelt Hotel, New York, Olympic Hotel, Seattle; National Town and Country Club, Cleveland Trust Company, Mount Sinai Hospital, Stillman Theatre and Wade Park Manor, all in Cleveland; Samaritan Hospital, Troy; Stamford Hospital, Stamford, Conn., and the apartment houses at 602-8 East 84th Street and 817 Fifth Avenue, New York.



An interesting Group of Prominent Architects and Artists in charge of the World's Columbian Exposition, in Chicago. The photograph dates from May, 1892. Reading from left to right, the men are: Daniel H. Burnham, P.P.A.I.A. (1894-5), George B. Post, P. P. A. I. A. (1896-8), M. B. Pickett, Henry Van Brunt, P. P. A. I. A. (1899), F. D. Millet, Maitland Armstrong, Col. E. Rice, Augustus St. Gaudens, Harry S. Codman, George V. Maynard, and Charles F. McKim, P.P.A.I.A. (1902-3).

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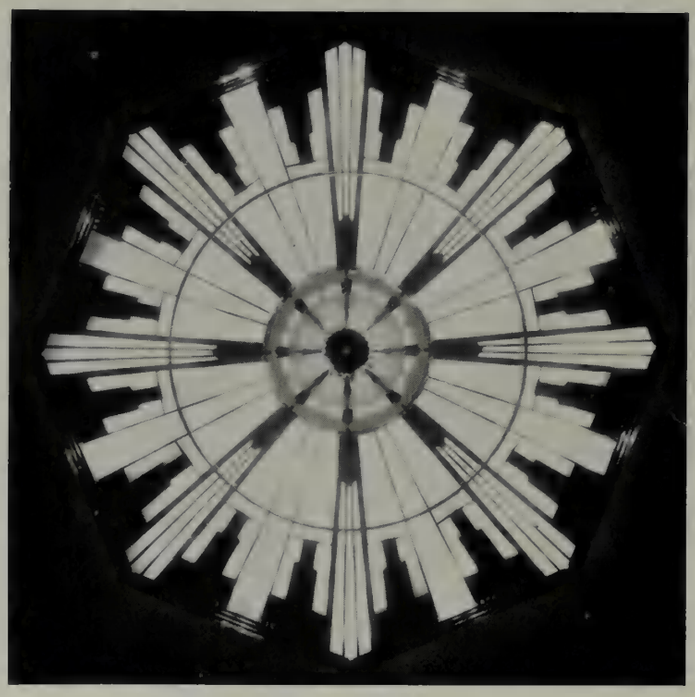
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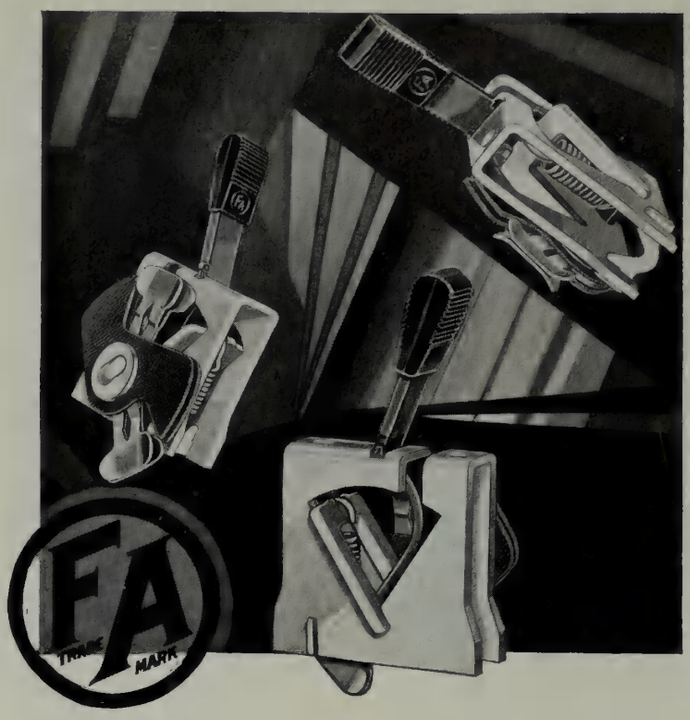
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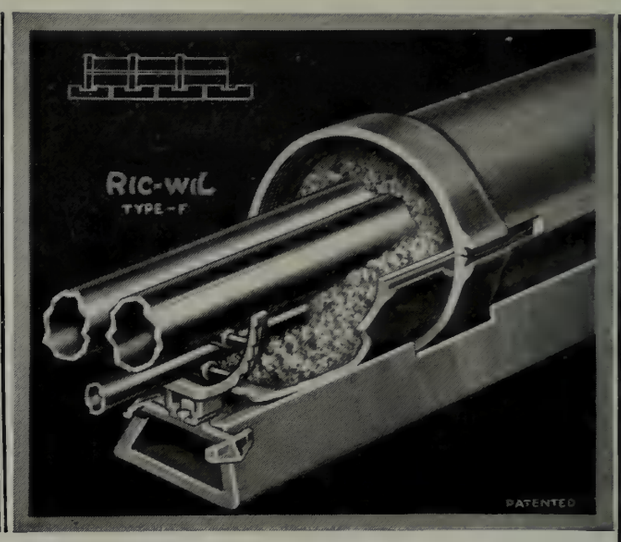
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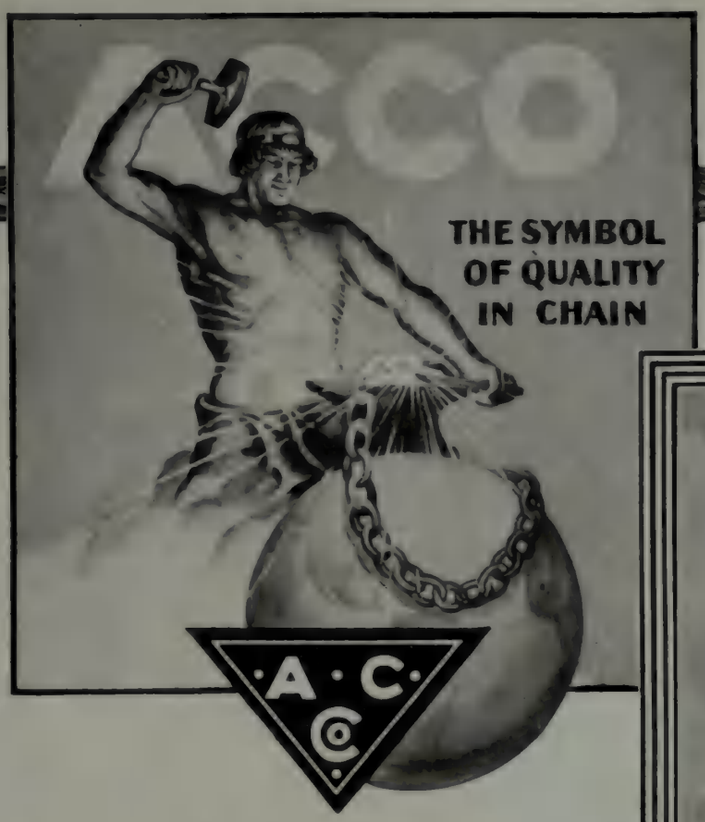
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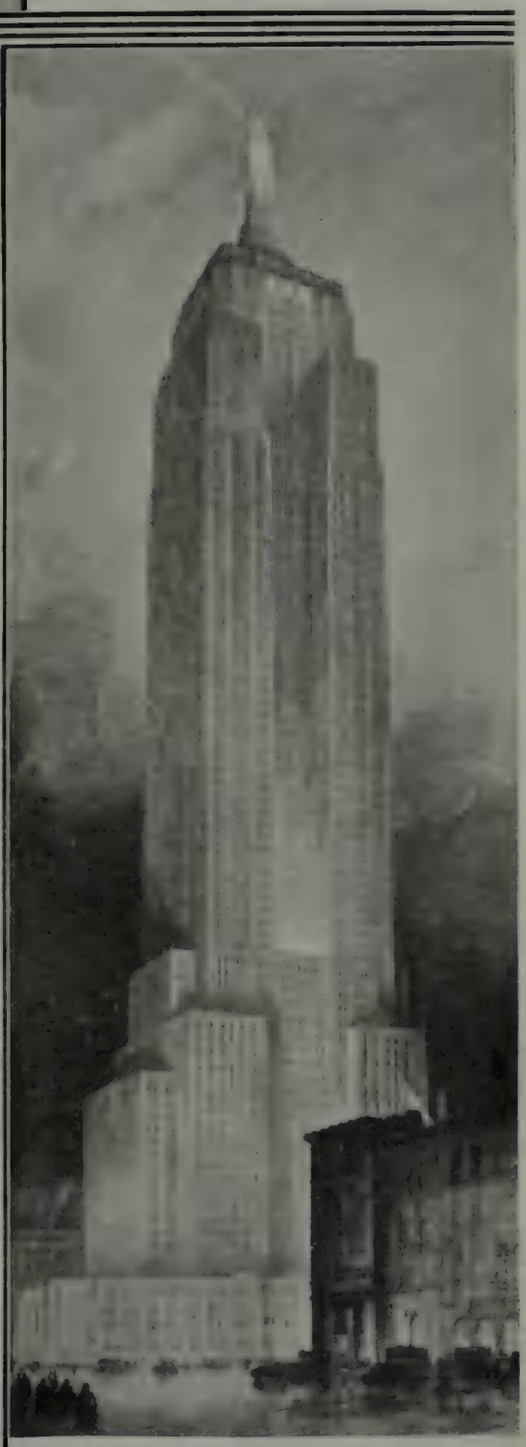
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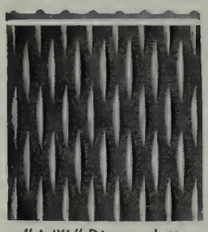


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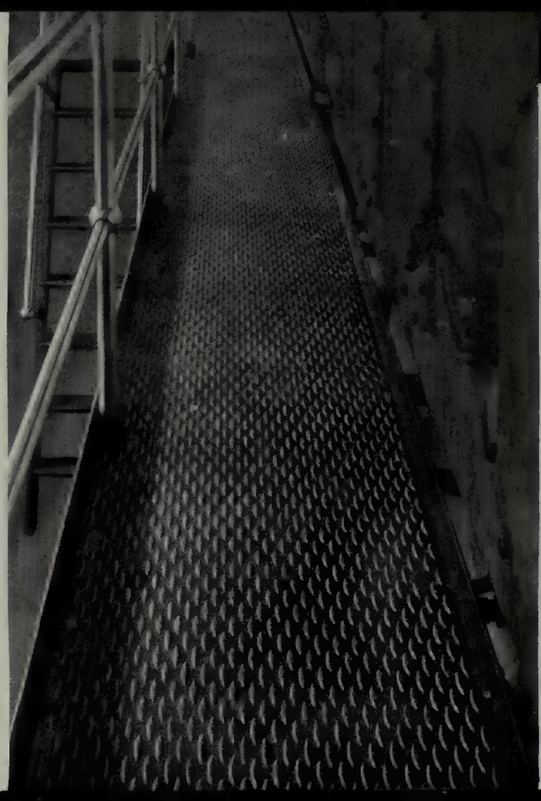
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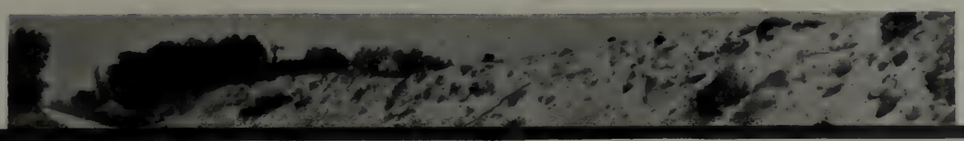
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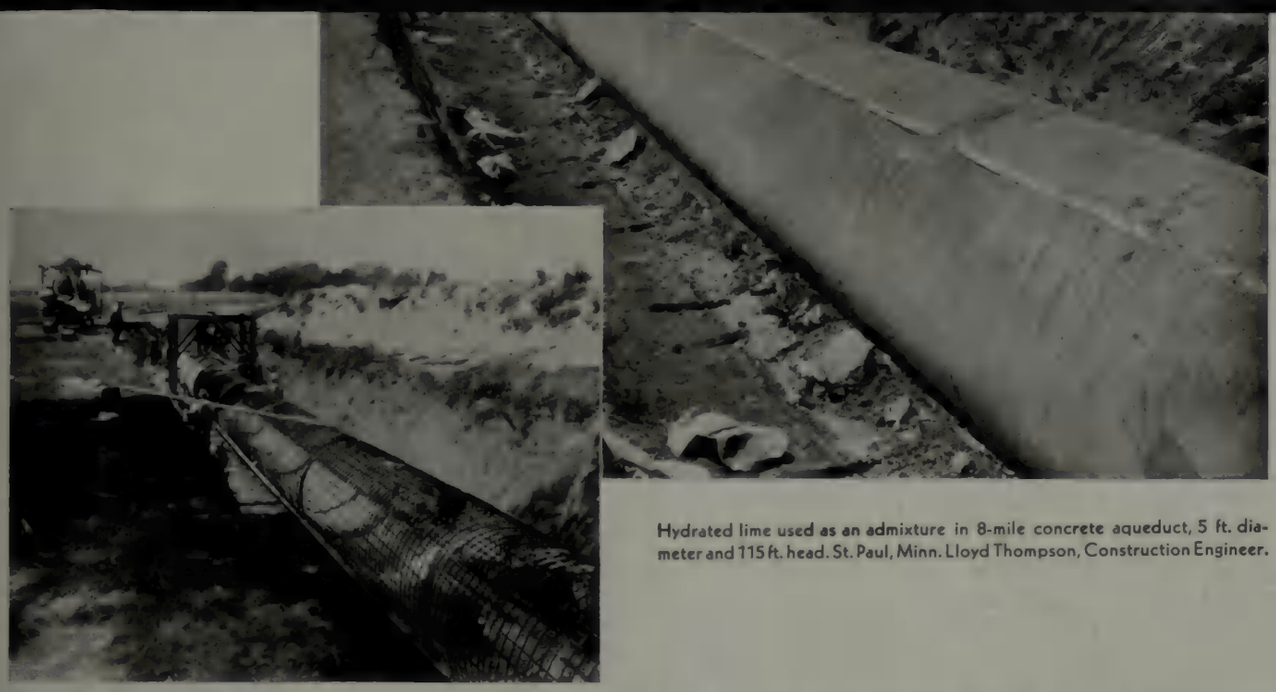
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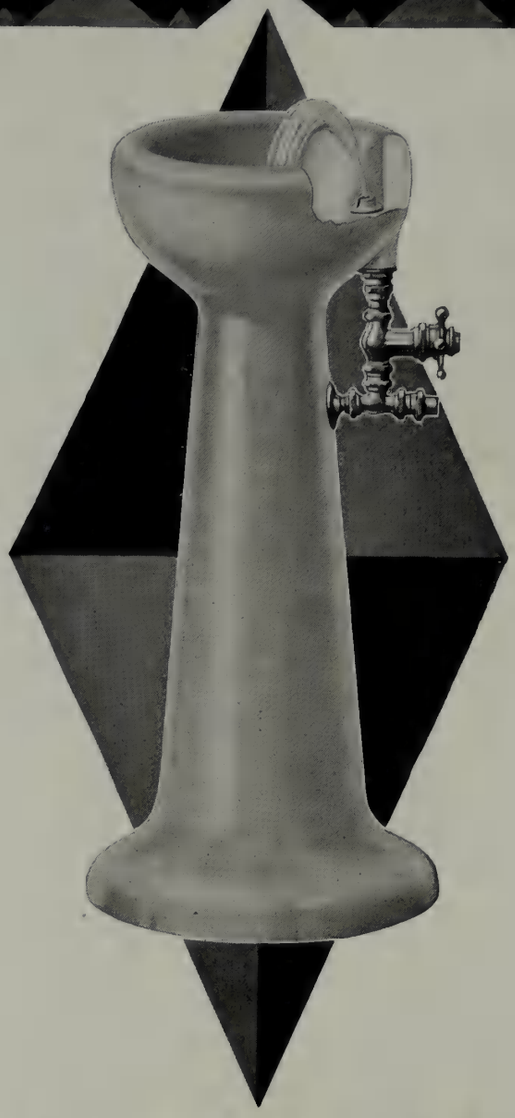
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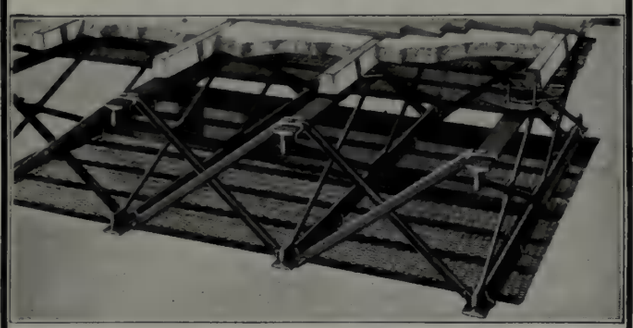
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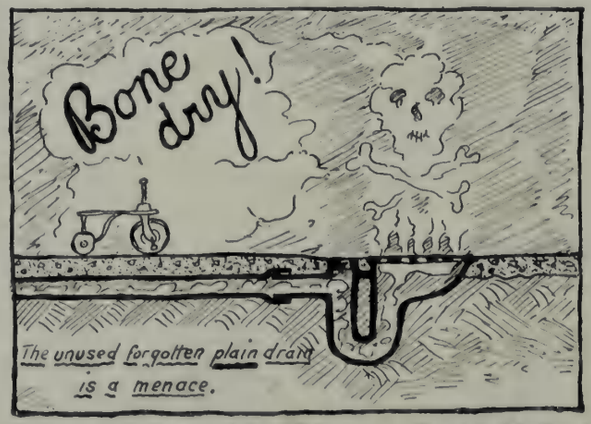


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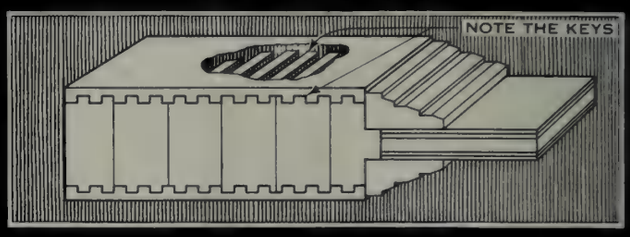
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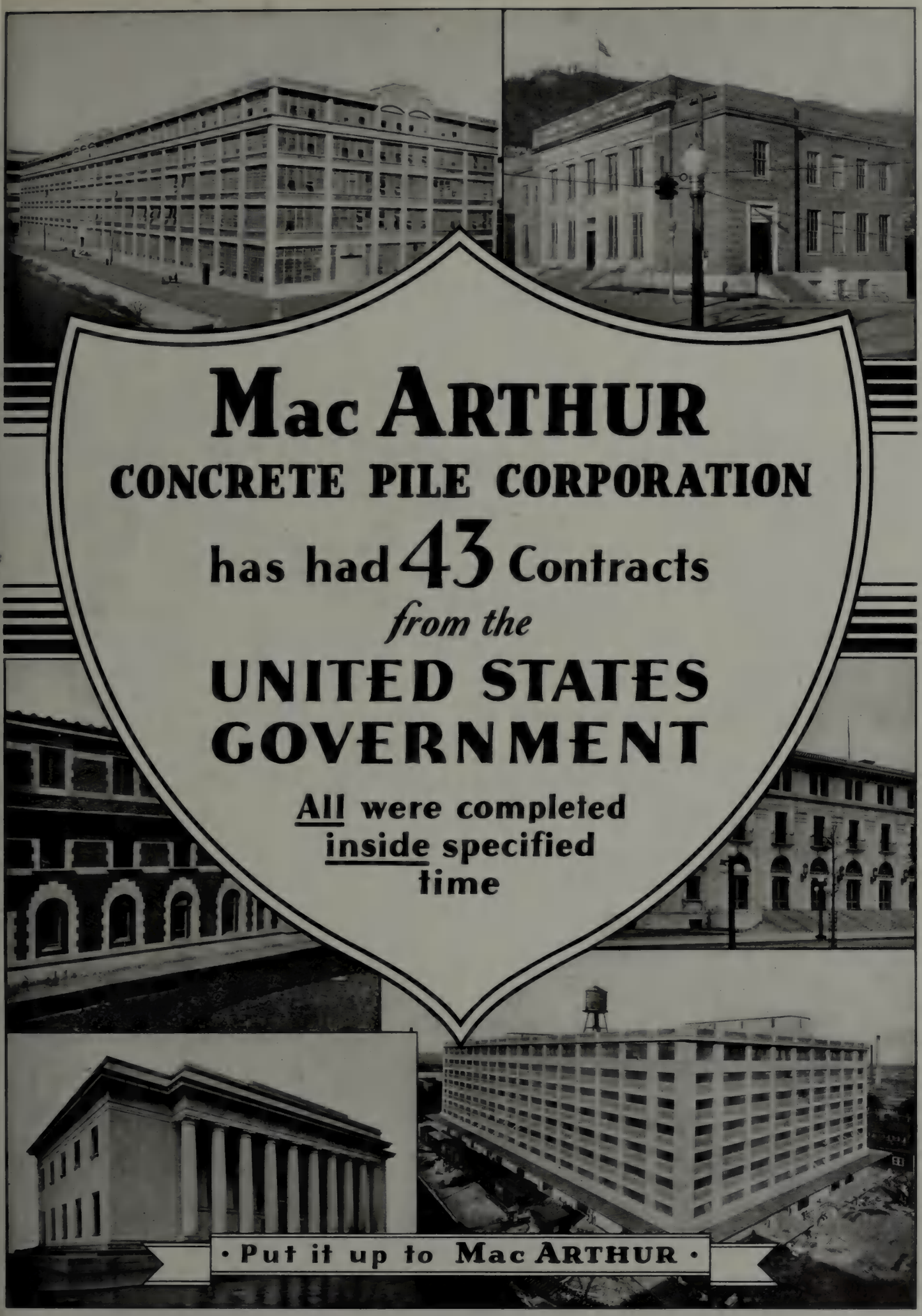
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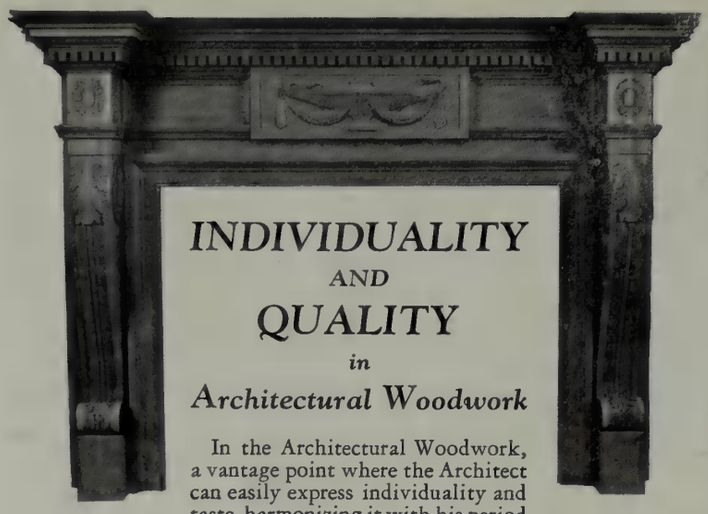
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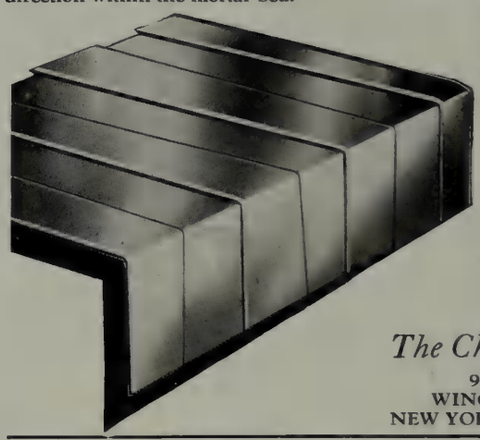
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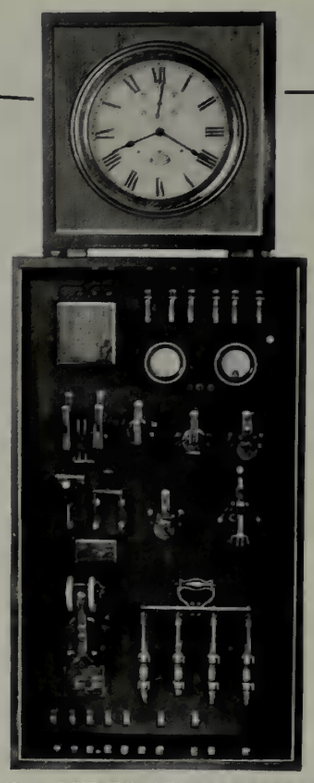


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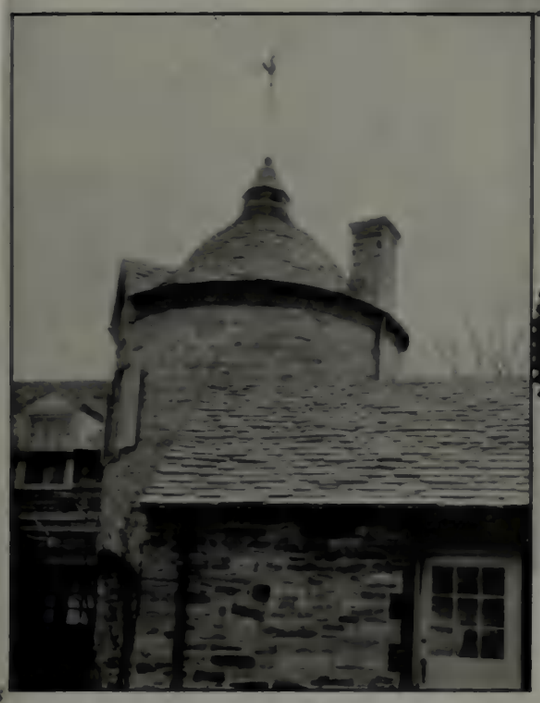
The "Vanishing Door" hinges on which the doors are hung are made with double pivoted arms and swing the doors back into the wardrobe entirely out of the way. There are no noisy tracks nor rollers to stick or bind, nor intricate mechanism to get out of order. These hinges are guaranteed to last as long as the building.

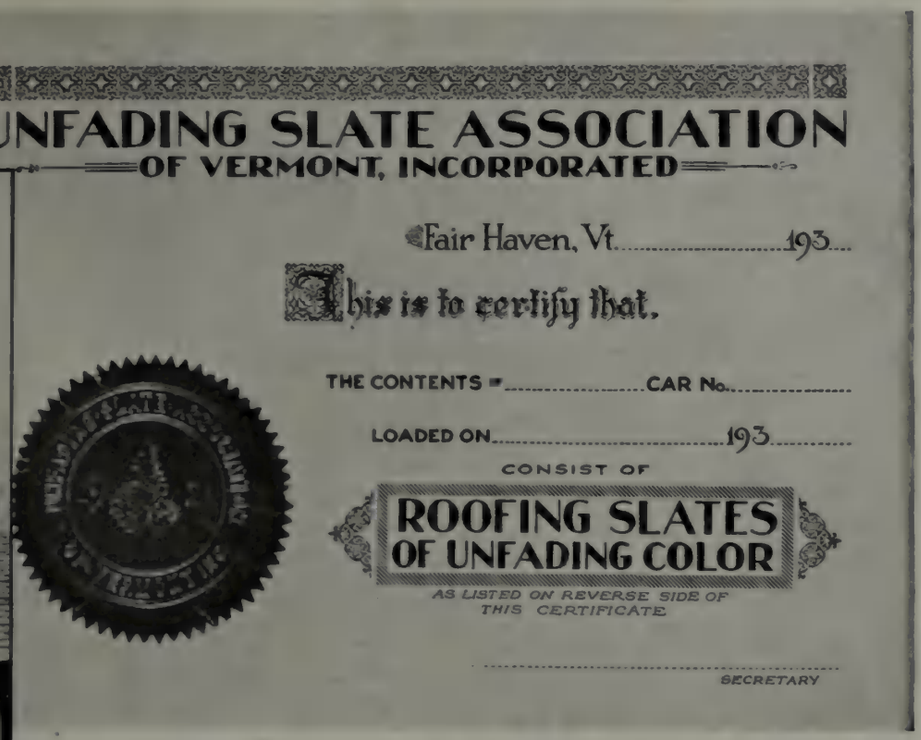
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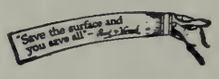
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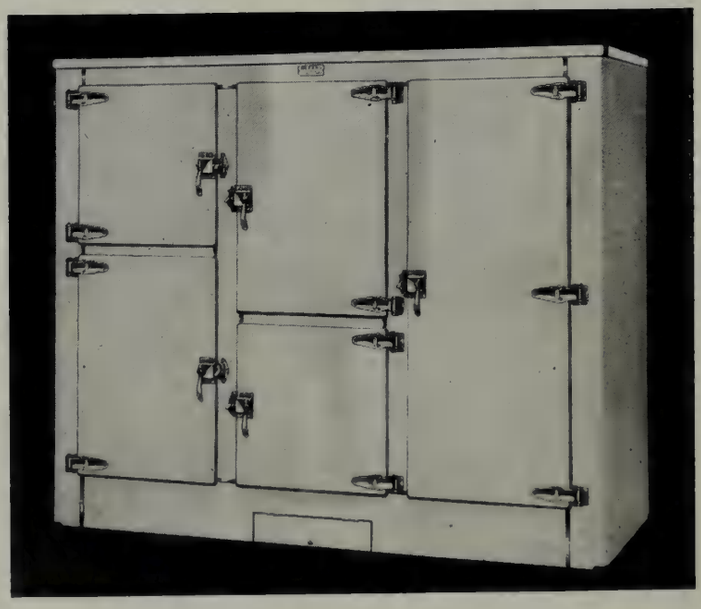
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NOTES IN BRIEF

and

Architects' Announcements

CALENDAR OF EVENTS
GENERAL ANNOUNCEMENTS

August	"Man and Machines," an exhibit representing western industrial civilization, at Museums of the Peaceful Arts, 220 East 42nd Street, New York City.
August, September	Exhibition of modern Architecture and Industrial Arts at Stockholm, Sweden.
August	The German *Werkbund* Exhibition at the Grand Palais in Paris. Exhibition of modern furniture, steel apartment house layouts, new construction, arranged by Prof. Walter Gropius of Berlin.
August-October	International Hygienic Exhibition at Dresden, Germany. Buildings include a model hospital and a model housing project.
Aug. 4-9	International Exposition of American Import Trade, Grand Central Palace, New York.
Aug. 12-21	Study Tour of the International Housing Association in Denmark, Sweden and Norway.
Sept. 7-14	Twelfth International Congress of Architects, Budapest, Hungary.
Sept. 8-13	A course of lectures on *Fundamentals of Architecture* for members of Illuminating Engineering Society, conducted by the School of Architecture, Columbia University, N. Y.
Oct. 1	The Committee of Twenty on Street and Outdoor Cleanliness, 2 East 103rd Street, New York City, have extended their prize contest for the design of a Litter Basket for New York City till October 1. First Prize $500.
October	The Department of Architecture of the University of New York will begin a series of lectures on "Promoting and Financing Building Projects."
Oct. 7-10	Annual convention of the Illuminating Engineering Society. Hotel John Marshall, Richmond, Va.
Oct. 8-12	Sixth National Conference of Church Architecture, Cleveland, Ohio.
Nov. 18-29	Art Exhibition, Royal Institute of British Architects, London (9, Conduit Street).
1930	Entries in the competition for the most beautiful bridge in North America are invited. Information can be had from F. H. Frankland, c/o Bridge Committee, American Institute of Steel Construction, Inc., 200 Madison Ave., New York City.

Colin J. Robb, architect, Timpany House, Ballynahinch, Co. Down, Ireland, desires to get in touch with manufacturers who are makers of church bells, lightning rods, theatrical lighting apparatus, hospital fittings, stable and kennel fittings, church metal work, stained glass, general cinema and theatrical fittings, church and cinema organs.

Milton M. Friedman, architect, announces the removal of his offices to Suite 635 Rives-Strong Building, 112 West Ninth Street, Los Angeles, Calif.

David Elms Graham Co., architect and engineer, formerly located at 3107 Beverly Boulevard, Los Angeles, has moved to 1144 South Grand Avenue, Los Angeles.

Frederick S. Stott, architect, announces a change of address from c/o Marsh, Smith & Powell, Architects' Building, Los Angeles, Calif., to 1180 Oak Grove Drive, Los Angeles, Calif.

Van Wart and Wein, architects, announce the removal of their office to larger quarters in the building where they are located at present, 347 Madison Avenue, New York City. New samples and up-to-date catalogues are requested.

CARL E. HOWELL

Word was received June 17, 1930, of the death at Monrovia, Calif., of Carl E. Howell of the firm of Howell & Thomas, architects. Mr. Howell had been in failing health for more than two years and had given up active work in Cleveland for the climate of New Mexico and California. He had been in California only two months.

Mr. Howell was born in Columbus in 1879, educated at Ohio State University and at the University of Pennsylvania. While at Pennsylvania, he won several scholarships. He was also awarded the John Stewardson foreign traveling scholarship in architecture and after his return entered practice with J. W. Thomas in Columbus in 1908. He was a member of the American Institute of Architects and the American Academy of Rome.

The work of Howell and Thomas includes the library and auditorium buildings for Ohio University at Athens, Ohio; East High School of Columbus, Ohio; high schools in Lakewood and Shaker Heights, Ohio; churches at Columbus, Canton and Oxford, Ohio; Y. W. C. A. buildings at Cleveland and Zanesville. They have also specialized in the planning and designing of newspaper buildings.

"Man and Machines," an exhibit of discoveries, inventions and mechanical devices depicting the rise of western industrial civilization, will be opened this month at the Museums of the Peaceful Arts, 220 East Forty-second Street, New York City.

One hundred industrial firms and individuals have been engaged for the last five months in preparing the exhibit. It will demonstrate the changes in economic and social life caused by the industrial revolution from the earliest times to the present. The exhibit is patterned after the one in the Deutsches Museum, Munich, which is visited each year by more than 1,000,000 persons. The collection will be strictly American.

FOREIGN TRAVEL

Eight European nations will be visited by students of the School of Architecture of the University of Southern California, who will go on the annual "vagabond" summer tour. The trip will be conducted under the direction of Dean Arthur C. Weatherhead and Prof. C. Raimond Johnson of the architectural faculty.

The latest trend in modern architecture will be studied by the students in various cities and countries, emphasis being placed on American work as contrasted with that of other nations.

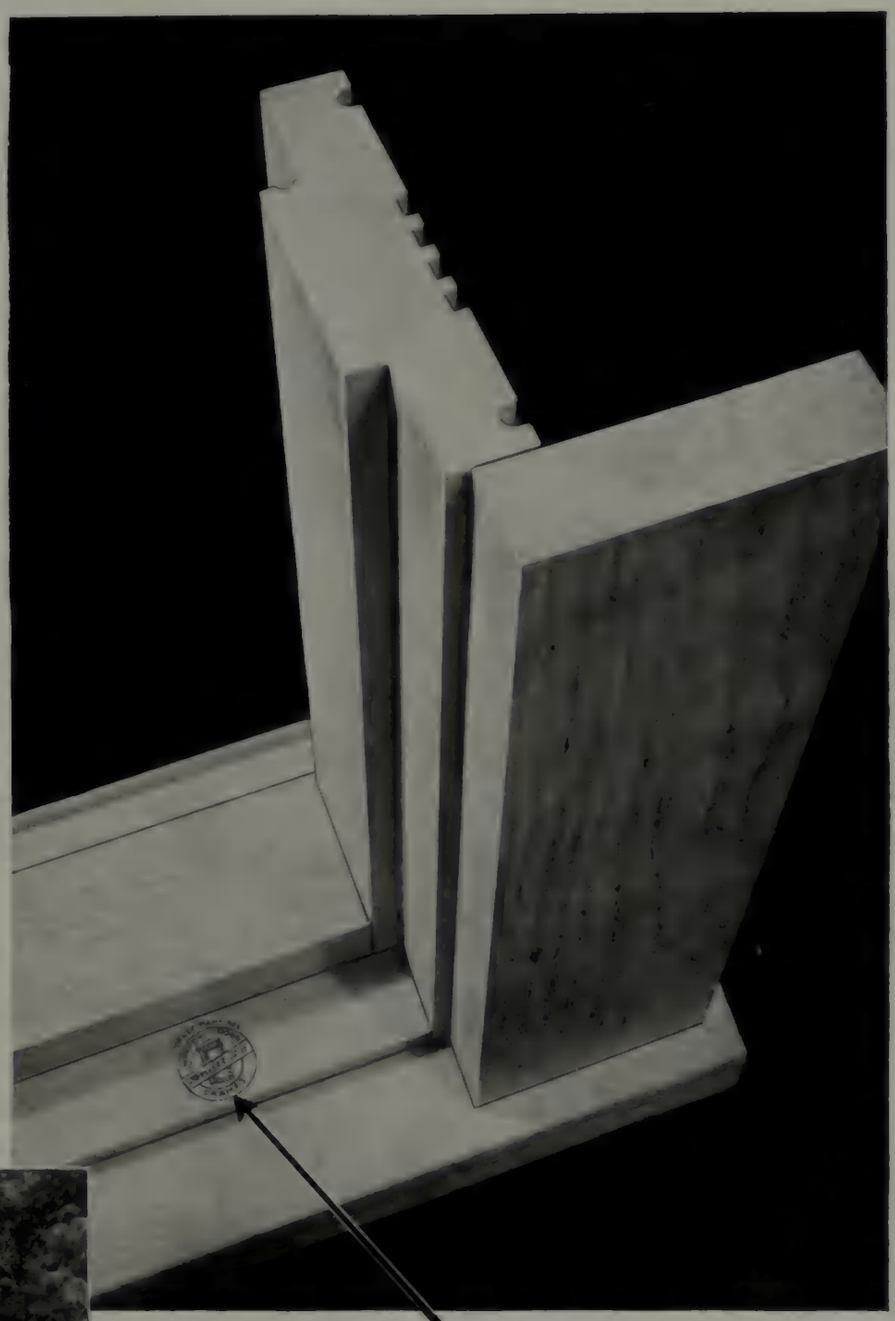
Real Casement Beauty Captured in new Andersen Master Frame with locked sill-joint

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MASTER WINDOW and DOOR Andersen FRAMES

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PARIS PRIZE

Announcement is made of the award of the 23rd Paris Prize in Architecture to L. B. Anderson, Massachusetts Institute of Technology.

The other competitors were:

George Brennan, Massachusetts Institute of Technology, placed second.

R. A. Weppner, Catholic University, placed third.

C. C. Braun, University of Illinois, placed fourth.

E. T. Pairo, Catholic University, placed fifth.

This prize has a stipend of $3,600. It is a national competition open to all citizens of the United States under 27 years of age, and enables the winner to study abroad for two and one-half years. It also carries the privilege of admission to the first class at the Ecole des Beaux-Arts in Paris without entrance examinations by a decree of the Minister of Public Instruction and Fine Arts of France.

The competition consists of three progressive eliminatory competitions. The first competition required a completely rendered drawing in twelve consecutive hours for a "Peace Memorial"; the second, of 24 hours' duration, required a rendered plan for "A Municipal Playground and Athletic Center for a Town of Moderate Size"; and the final competition required a sketch in 36 hours, of a solution for the problem "National School of Fine Arts." The competitors in the final stage were given ten weeks to develop and execute the drawings for their original sketched solution.

A CORRECTION

In the May issue photographs were shown of the Fox Theatre, Atlanta, Ga., and the work incorrectly attributed to John Eberson, architect. Marye, Alyn and Vinour were the architects for the project.

MODEL HOMES FOR PHILIPPINE SOLDIERS

In order to improve the housing conditions of the native soldiers under his command and to enable the post doctors to exercise direct medical and sanitary supervision over their living conditions, General Frank C. Bolles has started the erection of a "model barrio" on the post, the aim of which is to insure maximum comfort and health for the soldier and his family and to bring them into contact with modern methods of sanitation. Another object is to give an example of proper living conditions to other Filipinos. The houses which are being erected, although cheap, are well built, will not require constant repair, and are arranged so that the health conditions of the native soldier and his family will be improved in the hope of stamping out disease. Each soldier occupying quarters with his family pays a monthly rent of two pesos ($1.00), and in addition works one afternoon a week as his contribution to the barrio. All money received goes to the barrio fund which is used for the betterment of the barrio.

The houses are arranged in blocks of four double houses to the block. Each dwelling is built off the ground on wooden posts set in concrete blocks. The house is twenty-eight feet long and twenty-four feet wide. It has a porch in front six feet wide and a kitchen in back of the same width. The middle room, which may be partitioned to form two rooms, is sixteen feet by twelve feet. The frame of the house is wood, the side walls are sawali, and the dividing wall is of wood. The roof is of galvanized iron. When finished the houses are painted green with white trimmings. In the middle of every block there is a community bath built of concrete with galvanized iron roof and walls, containing four toilets, two showers, and a platform for washing clothes. This model village also enjoys the benefit of an incinerator as an additional help toward improved sanitation.

The recreation block is in the middle of the barrio. The center of this block is a public park and surrounding it will be the church, the school and the store. Six hundred families will eventually be housed in this barrio.

FIRE-RESISTING CONSTRUCTION

The report of the Building Code Committee, organized by The Merchants' Association to draft a new Building Code for theCity of New York, embodies a proposed new code governing the use of fire-resistive materials.

It is contemplated that when the whole new building code is completed, it will make provision for a new type of construction to be known as the partially protected or intermediate type, which, while not as resistive to fire as the present fireproof construction, will eliminate the hazards existing today in non-fireproof six-story apartments. This will be accomplished by using a lighter steel frame, a thin slab, wire lath and plaster partition and increasing the allowable height of the fire retarded building above the six stories allowed to non-fireproof structures today, to offset to some extent the increased cost.

TRAFFIC CONGESTION

Dr. John A. Harriss, president of the Broadway Association and national traffic expert, in speaking on the rapid growth of the automobile in the past fifteen years, declares that there are 29,000,000 automobiles in the United States and Canada and that $1,000,000 a working day is lost by street congestion in New York. This is about $300,000,000 a year, based on time lost by those who are compelled to use the thoroughfares.

"What does this mean in the future? If we continue to build office skyscrapers, big apartment houses or construction operations that go up 10 or 15 stories, and do not provide adequate means of taking care of the street traffic then we must either close up the city or eliminate the automobile. At the present time 4,800,000 persons over seven years of age use the streets daily.

"The solution in my opinion lies in erecting multiple highways on say Ninth and Second or Third avenues from six to twelve decks or levels in height. These would extend from the lower end of the city to the upper end and would be approached by ramps at various points along the line with corresponding ramps for means of exit.

"These levels would provide one-way thoroughfares for various classes of vehicles. At the lowest levels there would be two avenues for trucks, then, as we ascend, two for buses, two for taxis, two for pleasure cars, two for storage and parking, and two for fire apparatus and other emergency use, each class having separate boulevards for northbound and for southbound travel. Six, of these levels could be put in operation as a starter on both sides of the city."

The Dunham Differential Vacuum Heating System

From NEW YORK to SAN FRANCISCO



19 Rector Street Building
New York City
Owners:
Gening Realty Corp.
Architect:
Lafayette A. Goldstone
Herbert Lau and
Hugh C. Porter,
Associates
Consulting Engineers:
Jaros & Baum
Builders:
Gresham Construction
Co., Incorporated
Heating Contractor:
Raisler Heating Co.

Over 800 installations of the Dunham Differential Heating System in both new and existing buildings of all types show that fuel savings of from 25% to 40% are uniformly obtained.



SAN FRANCISCO

Pacific National
Bank Building
San Francisco, Calif.
Architect.
W. D. Peugh
Heating Contractor:
Jas. A. Nelson, Inc.

OWNERS of big properties on both coasts and many others in between have selected Dunham Differential Heating as a sound equipment investment based on proved records of uniform, comfortable heating *plus* economy that cuts 25 to 40% off the fuel bills.

NEW YORK

Find out about Differential Heating advantages as applied to your properties. Many existing heating plants can easily be converted to Differential operation. The fuel savings will pay for the change.

C. A. DUNHAM CO.

Dunham Building

450 East Ohio Street Chicago, Illinois

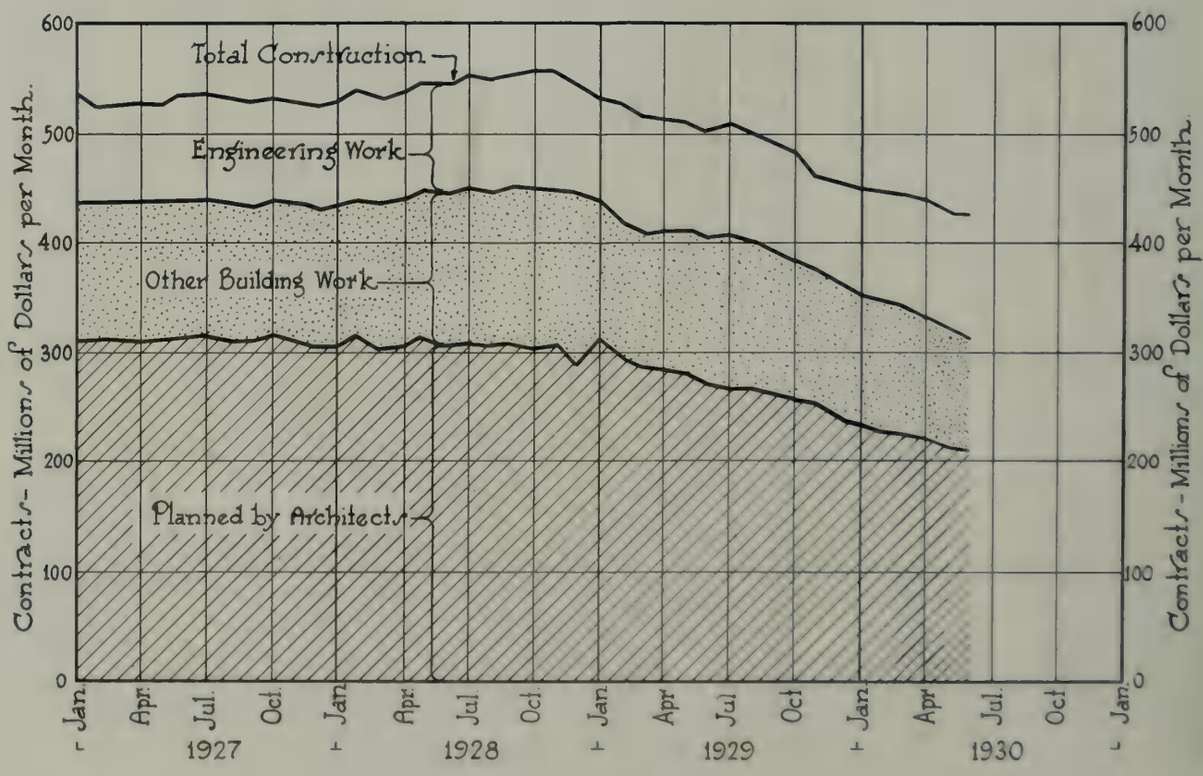
Over 80 branch offices in the United States and Canada bring Dunham Service as close to you as your telephone. Consult your local directory. Dunham engineers are at your service with complete and authoritative data on improved heating to meet your individual requirements.

CONSTRUCTION STATISTICS

From the records of F. W. DODGE CORPORATION, Statistical Division. The figures cover the 37 states east of the Rocky Mountains and represent about 91 per cent. of the country's construction volume. They include projects amounting to $5,000 and up.

First Half, 1930

	TOTAL CONTRACTS		WORK PLANNED BY ARCHITECTS		
	Number of Projects	Valuation	Number of Projects	Valuation	Per Cent. of Total
Commercial Buildings	12,243	$409,618,300	4,666	$327,116,900	80
Industrial Buildings	2,800	323,403,600	935	86,098,200	27
Educational Buildings	2,338	196,563,400	1,905	189,524,100	96
Hospitals & Institutions	589	95,224,200	453	87,631,000	92
Public Buildings	689	62,322,300	430	50,574,100	81
Religious & Memorial Buildings	1,054	56,224,900	742	52,366,100	93
Social & Recreational Projects	1,317	66,505,300	808	58,013,600	87
Apartments & Hotels	2,858	196,445,000	1,606	165,986,000	84
One & Two Family Houses	36,952	382,967,600	9,025	172,712,500	45
Total Building	60,840	$1,789,274,600	20,570	$1,190,022,500	67
Public Works & Utilities	10,104	848,738,700	138	21,936,800	3
Total Construction	70,944	$2,638,013,300	20,708	$1,211,959,300	46
Total Construction, 1st half, 1929	92,395	$3,015,546,800	27,037	$1,536,834,500	51



General Trend of Building and Engineering Construction

CONTRASTS IN INDUSTRIAL PROGRESS





A one camel-power pump in Morocco

Perfectly content to spend his life traveling an inexorable circle, the camel here typifies the country which supports him. The centuries have left no mark mechanically on the sandy wastes known as Morocco, the land of desert warfare and religious fervor.

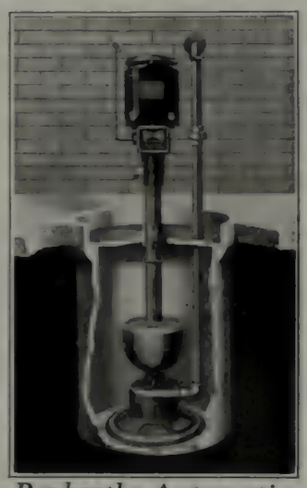
Water is elevated in the chain of earthen pots operated by the crude wooden device that is perhaps best described as a forerunner of a pair of bevel gears. Contrast this with the simple and efficient pumps we use today—equipment like the Penberthy Automatic Electric Sump Pump and Cellar Drainer, which are thoroughly automatic, fully dependable and have low operating costs.

Here indeed are the opposite ends of the march of progress.

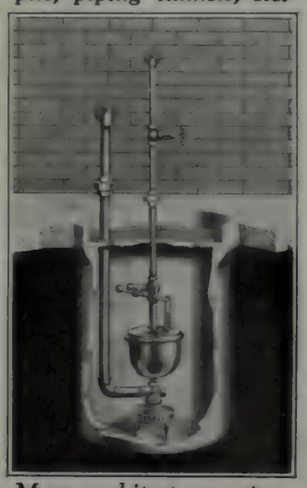
PENBERTHY INJECTOR COMPANY

ESTABLISHED IN 1886 — DETROIT — CANADIAN PLANT WINDSOR, ONT.

PENBERTHY PRODUCTS



Penberthy Automatic Electric Sump Pumps and Hydraulic Cellar Drainers for draining seepage water from basements, elevator pits, piping tunnels, etc.



Many architects are specifying these pumps to the complete satisfaction of their clients. Penberthy Pumps are quickly obtainable from practically all leading jobbers.

El Dorado Towers, 300 Central Park West, New York City, Margon & Holder, Architects, Elkay Builders Corp., Builders.



•

WHY

MODERN

APARTMENT BUILDINGS

are now being equipped with

•RCA•

CENTRALIZED RADIO

Antenna and ground outlets in all apartments

High-class apartment construction of today has definitely eliminated unsightly antennae on the roof... and demanded the installation of the antenna distribution type of RCA Centralized Radio.

Scores of modern apartment buildings now include this new RCA system of providing multiple radio outlets connected with a centralized antenna.

In this way, radio reception is improved and any number of tenants are now able to plug in their sets at convenient outlets and tune in their favorite stations in the usual manner.

RCA Centralized Radio equipment has been approved by the National Board of Fire Underwriters. Each and every item has been especially designed and developed by RCA engineers for Centralized Radio use, as *adapted* equipment has not been found suitable for the purpose.

For Hotels, Hospitals, Schools . . .

RCA Centralized Radio Equipment is also designed for hotels, hospitals, sanitariums, schools, passenger ships, etc., where transient occupants of rooms may enjoy radio programs or phonograph record entertainment from loudspeakers or headsets, all operated from a central control.

The Engineering Products Division, RCA Victor Company, Inc., will answer inquiries and prepare plans and estimates for installations of any size.

ENGINEERING PRODUCTS DIVISION, SECTION A

RCA VICTOR COMPANY, INC.

233 Broadway, New York, N. Y.

See the permanent RCA Centralized Radio Exhibit at the RCA-Victor Show now at Atlantic City.

A REVIEW OF CATALOGUES

BATHROOM ACCESSORIES

"All Tile" bathroom accessories to match the surrounding wall tile. Combination fixtures for hotels and apartments; special designs for the modern bathroom. Particulars of size, finish and style. The Mosaic Tile Company, Zanesville, Ohio. 8½ x 11 in. 8 pp. Ill.

TILE, CLAY

Natco double shell load bearing tile, for stuccoed exterior walls or brick and stone faced walls. Table of mortar required for 100 sq. ft. of wall. Detail drawings. 6 pp. folder. 8½ x 11 in. Ill. Also, 4-page folder on Unibacker tile, for load bearing curtain and closure walls. National Fireproofing Corporation, Fulton Bldg., Pittsburgh, Pa.

BUSS-WA

Copper bar system for power and light distribution. Description of Buss-Wa units. Installation cost. Provisions and requirements. Actual installations. Typical riser diagram and wiring schedule. Special uses in various important fields. Advantages. The Trumbull Electric Mfg. Co., Plainville, Conn. 8½ x 11 in. 16 pp. Ill.

SHINGLES, STAINED

"Cabot's Creosote Stained Shingles." The picturesqueness and economy of shingles. Approximate comparative costs of wall and roof construction. Wear resistance and covering capacity of wooden shingles. Fire resistance. Cabot's "Anteaks", white stained, old Virginia white, double-white and 42-year-old roof shingles. Heat-insulating and sound-deadening quilt. Collopakes. Specification. 8½ x 11 in. 16 pp. Ill. Also booklet on Cabot's Creosote Shingle and Wood Stains. Uses and directions for application. 3½ x 6 in. 16 pp. Ill. Folder on Cabot's creosote shingle and wood stains. Actual samples. Uses; applications; covering capacity. Samuel Cabot, Inc., 141 Milk St., Boston, Mass.

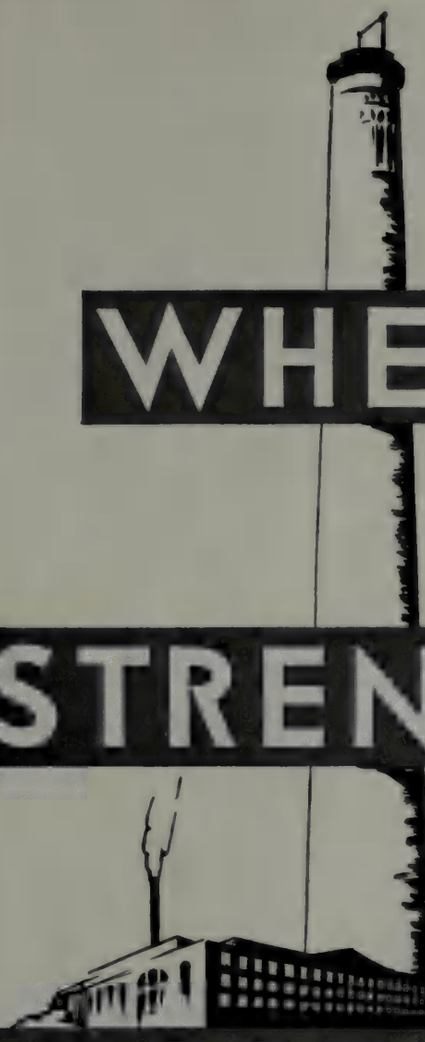
TERRA COTTA

Wall units of Atlantic terra cotta. Suitability for interior walls; economy; dimensions and description. Modeled wall units. Uses and supplementary uses. Colors; design. Durability and maintenance. Price. Specifications for the manufacture, furnishing and setting of Atlantic wall units. Detail drawings of various types. Detail drawings of types used in typical installations, including American Museum of Natural History, New York; Waldorf-Astoria Hotel, New York; Brooklyn State Hospital, L. I., New York. Atlantic Terra Cotta Co., 19 West 44th Street, New York City. 8½ x 11¼ in. 112 pp. (Loose-leaf.) Ill.

WOOD PRESERVATIVE

Tri-Treat, a wood preservative developed for E. L. Bruce Company by Dr. James W. Lawrie and Associates, Milwaukee, Wis. Prevents attack by termites and rot fungi. Technical report giving facts on Tri-Treat and the Tri-Treating process. Characteristics; tests. Where to use in sheltered and exposed construction. E. L. Bruce Co., Memphis, Tenn. 8½ x 11 in. 16 pp. Ill.

WHERE STRENGTH IS ESSENTIAL



WHEN tested in piers, Brixment mortar approaches straight 3-to-1 portland cement mortar in strength.

And since Brixment is more plastic, is ground finer and hardens more slowly, it insures a better bond and more thorough bedding of the brick.

Ideal for foundation, load-bearing or parapet walls and even for tall, free-standing stacks. Louisville Cement Company, Incorporated, Louisville, Kentucky.

CEMENT MANUFACTURERS SINCE 1830

BRIXMENT

For MASONRY and STUCCO





PUMPS

Centrifugal pump selection chart bulletin No. 201. Multi-stage pumps for capacities up to 2000 G.P.M. and heads up to 2400 feet. Complete description, including cross sections with details and dimensions for each pump. Specifications. Features of design and construction. Typical installations. Goulds Pumps, Inc., Seneca Falls, N. Y. 8½ x 11 in. 32 pp. Ill.

STOVES

Chromium finish custom built ranges for fine homes. Blue-prints offered of gas ranges originated to fit special dimensions. Typical examples with particulars regarding ovens, dimensions, cooking surface, equipment and finish. Blue-prints and specifications. Typical installations. American Stove Company, 925 Chouteau Avenue, St. Louis, Mo. 8½ x 11 in. 24 pp. Ill.

PARTITIONS

"Office Planning Studies." Plans for single desk offices and two-desk offices. Swing and location of doors and types of doors. Access to corner offices. Half, full, one and one-half and two-bay units. Wing space, the center island and open center plans. The inside corner unit. Lighting arrangements. Ventilation. 8⅝ x 11¼ in. 40 pp. Ill. Also, "Hauserman Movable Partitions, Types T & R." Special features and advantages. Standard details. Full information. The E. F. Hauserman Company, 6805 Grant Avenue, Cleveland, Ohio. 8½ x 11 in. 8 pp. Ill.

WINDOWS, STEEL

"Your Windows Through a Decorator's Eye." Color schemes and furnishings for living room, library, dining room, breakfast nook, sun porch, bedroom, child's room, bathroom, kitchen. Color chart. The windows and their drapery. Metal screens, storm windows and drapery brackets. Shade and drapery fixtures for Lupton casements. Casement doors. David Lupton's Sons Company, Allegheny Ave. and Tulip St., Philadelphia, Pa. 6½ x 9¼ in. 24 pp. Ill.

METAL DOORS AND TRIM

Dahlstrom Metallic Door Company graphically illustrate their 25 years' growth and progress in the manufacture of metal doors, trim, partitions, etc., in 10 pages of very detailed information.

The catalogue also contains extremely valuable information in regard to elevator hatch doors and enclosure details. Stock patterns of all products are profusely illustrated and described by number for convenience in selecting and specifying. 10 pp. Dahlstrom Metallic Door Company, Jamestown, N. Y. (This catalogue is in Sweet's for 1930.)

SOLID METAL WINDOWS AND METAL DOORS

Thirty-one pages tell the catalogue story of the Federal Steel Sash Company regarding their solid metal windows and metal doors. Among the many types shown, are to be found, particularly featured, their commercial and architectural projected windows. Pivoted and hinged windows of small dimensions and large ones requiring hand and power operating devices are illustrated. Four pages are devoted to industrial doors. 31 pp. Federal Steel Sash Co., Waukesha, Wis. (This catalogue is in Sweet's for 1930.)

(Continued on page 164)



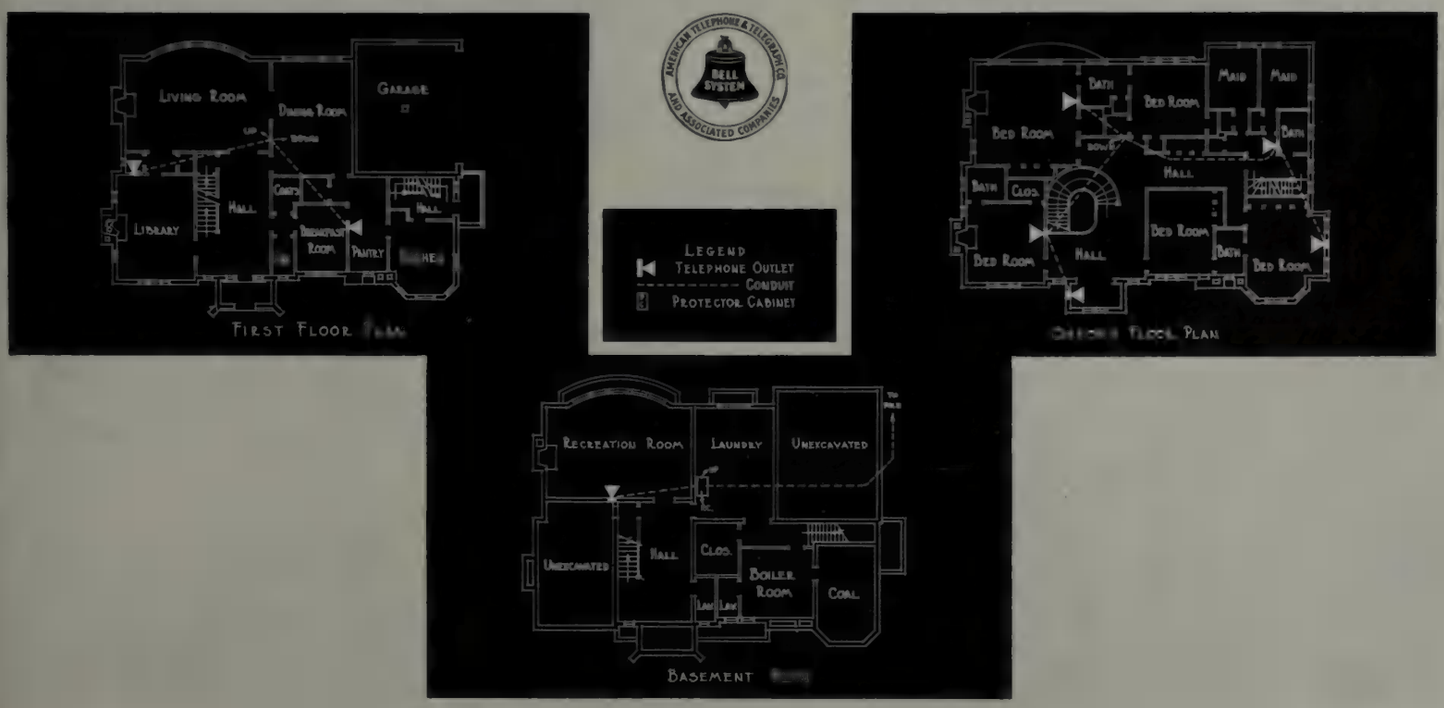
In the residence of Mr. Percy N. Calvert, 18040 South Woodland Road, Shaker Heights, Cleveland, Ohio, eight telephone outlets provide for modern telephone convenience. Here the telephone wiring is carried in conduit built into the walls and floors. Monroe E. Deane, Architect. The H. W. Brown & Son Company, Builders, *Cleveland.*

Flexibility is always Desirable in the Telephone arrangements of a Residence

In planning for the telephone arrangements of the houses they design, many architects include provision for more telephone outlets than the home owner may immediately require. This foresight insures a flexibility of service that often proves very desirable. When a residence is first occupied, telephones are needed in certain rooms. A change in the use of these or other rooms may involve the shifting of the telephone arrangements, and with outlets available at convenient locations, this rearrangement or expansion is easily accomplished.

Appropriate locations for telephone outlets can be determined in conjunction with the home owner, the architect and a representative of the local Bell Company. Conduit for the telephone wiring is then specified, and built into the walls and floors during construction. This results in improved appearance, and guards against certain types of service interruptions.

You and your clients are most cordially invited to consult with representatives of the local Bell Company in planning for the telephone arrangements for new and remodeled houses. No charge is made. Just call the Business Office.



Insulate with

U. S. MINERAL WOOL

• COLD-PROOF • HEAT-PROOF •

FIRE-PROOF • SOUND-PROOF • VERMIN-PROOF



Cooler Rooms During Summer Heat

THE insulation of your home with U. S. Mineral Wool is an assurance of greater summer comfort.

All rooms, even attic rooms, are many degrees cooler in summer, if protected with this all-mineral, indestructible and vermin-proof material. Placed in the walls and rafters and between floors of a house, U. S. Mineral Wool forms a protective shield through which torrid summer heat or frigid winter cold cannot penetrate. Insulation is a year-round comfort provider and a decided money saver.

Winter fuel bills are decreased about one third and this annual saving steadily continues as Mineral Wool once installed will outlast the building.

Send coupon for free sample and illustrated booklet.

U. S. Mineral Wool Company

280 Madison Avenue, New York

Western Connection:

Columbia Mineral Wool Co., S. Milwaukee, Wis.

U. S. MINERAL WOOL CO., DEPT. E
280 Madision Ave., New York
Send FREE sample and illustrated booklet to

Name.....

Address.....

City.....State.....

A REVIEW OF CATALOGUES—Continued

REFRIGERATORS

All steel electric refrigerators for domestic, commercial, institutional and other installations are shown in great variety by the General Electric Company in ten pages. Very full description is given of all working parts and the principles of refrigeration and operation. Many illustrations are used to show various models and types. Full dimensions are given. Plans and suggestions are presented to illustrate the advantageous location of refrigerators. 10 pp. General Electric Company, Cleveland, Ohio. (This catalogue is in Sweet's for 1930.)

"MOVING FACTORS"

How a growing need is met for means to readily move and operate heavy and unwieldy things which must be moved in buildings, such as large doors, partitions, gates, portable walls, etc., is told by Allen & Drew in 34 pages. Solutions of problems in mobility are given not only for the usual and familiar requirements but for new and progressive purposes which distinctly aid the architect to plan the use of space with an economy and efficiency not hitherto thought possible. The electric motors and accessory devices to be used are explained for a large variety of typical cases and details of installation are shown. A perusal of this catalogue will suggest that a "fourth dimension" in building construction has been discovered. "Open Sesame" is the thought colorfully pictured on the catalogue cover and the text justifies the idea. 34 pp. Allen & Drew, 43-45 Brookford Street, Cambridge, Mass. (This catalogue is in Sweet's for 1930.)



Heating and Ventilating Units



YOU can specify PeerVent Units with complete confidence. They are positively silent in operation, highly efficient, and dependable. Peerless Units built *eighteen years ago* are still giving perfect satisfaction. The latest PeerVent is improved throughout—better radiator, better motor, better fans, and better controls.

PEERLESS UNIT VENTILATION CO., INC.

Pioneers in Unit Ventilation

Bridgeport, Connecticut

Selling Agents in Principal Cities from Coast to Coast

"Say, Lad —

This friend of yours, 'Arc Welding' of whom you're always shouting. Why is it I never hear him on a job?"



PROGRESS



TRADITION



Studies in Structural Arc Welding

Plates 1 to 17, inclusive, are available to Architects, Structural Engineers and Steel Fabricators. They will be delivered gratis upon request to Dept. No. 30-8.

"No, Pop —

You never will. He operates on the Quiet. Wherever there's a quiet job of steel erection going on, you'll find a one-piece steel structure in the making . . . stronger, stiffer for its weight than the noisy jobs you've specified.

Why punch steel beams full of holes and their supporting columns likewise just to fill 'em up again accompanied by a deafening racket only equaled by the client's neighbors' howls.

When your brain children start to grow up let them be seen but not heard."

The Lincoln Electric Co., Dept. No., 30-8, Cleveland, O.



"Stable Arc"

W-153

LINCOLN WELDER





Heavy tubular frame strongly welded

WELDED BRONZE DOORS for COMMERCIAL BUILDINGS

The rails and stiles of this door consist of heavy tubular members, the joints of which are strongly welded. The inner edge of the frame is trimmed with shapely mouldings used for securing the center panel. With necessary hardware furnished and applied the complete ensemble presents a unit appropriate for use in the finest commercial buildings.

Send for complete description and F. S. details.

THE
Kawneer
COMPANY
Niles, Mich.
Subsidiary: Berkeley, Calif.

ALSO SHOWER STALLS AND SHOW CASE DOORS

CLASSIFIED DIRECTORY OF ADVERTISERS

Alphabetical Index to Advertisers, Page 182

After reviewing advertisements in this issue—use Sweet's Architectural Catalogues for 1930 for catalogue and specification information on the products of the most of the manufacturers.

Acid Proof Chemical Stoneware
Knight, Maurice A.

Acoustical Installation—Armstrong Cork & Insulation Co.
Guastavino, R., Co.

Acoustics
Armstrong Cork & Insulation Co.
Boston Acoustical Eng. Division of Housing Company
Johns-Manville Corp.

Air Compressors
Westinghouse Traction Brake Co.

Air Conditioner
American Blower Co.
Buffalo Forge Co.
Doherty-Brehm Co.
Lewis Corporation

Air Washer
Buffalo Forge Co.

Aluminum
Aluminum Co. of America

Anchors—Concrete
Bulldog Floor Clip Co.

Arc Welding—Lincoln Electric Co.

Architectural Supplies
Higgins, Chas. M., & Co.

Artstone—Rackle, George, & Sons Co.

Asbestos—Johns-Manville Corporation

Balances, Sash—See Sash Balances

Basement, Windows—Steel
Detroit Steel Products Co.
Truscon Steel Company

Bathroom Accessories
Parker Charles Company

Beads—Corner Metal
Milcor Steel Co.
Truscon Steel Company
Wheeling Corrugating Co.

Beams, Angles, Channels, Etc.
Bethlehem Steel Co.
Carnegie Steel Company
Jones & Laughlin Steel Corp.

Belts—Dayton Rubber Mfg. Co.

Blackboards—Weber Costello Co.

Boiler and Pipe Covering
Johns-Manville Corporation
Ric-wiL Company

Boilers—American Gas Products Co.
American Radiator Co.
Bryan Steam Corp.
Dahlquist Mfg. Co.
Heggie-Simplex Boiler Co.
Pierce, Butler & Pierce Mfg. Co.
Smith, H. B., Company, The, Inc.
Titusville Iron Work Co.
Wood Gar Engineering Co.

Bolts—Door—Corbin, P. & F.

Brass and Bronze
See "Ornamental Metal"

Brass and Copper
See "Copper and Brass"

Brick—Finzer Bros. Clay Co.

Bridges—Steel—American Bridge Co.
Bethlehem Steel Co.

Builders—Stone & Webster, Inc.

Buildings—Steel
Carnegie Steel Company
Nat'l Assoc. of Flat Rolled Steel Mfrs.

Butts—Corbin, P. & F.
Stanley Works

Cabinet Work—Hyde-Murphy Co.

Cabinets—Kitchen
Olean Metal Cabinet Works, Inc.

Cabinets—Medicine—Parker Charles Company

Cabinets—Toilet Paper
Victoria Paper Mills Co.

Casement Operators—Rixson, Oscar C., Company

Casements—Bayley, William, Co.
Crittall Casement Window Co.
Detroit Steel Products Co.
International Casement Co.
Meaker Bros. Iron Company
Truscon Steel Company

Cast Stone
Cast Stone Institute

Cellar Drainer
Penberthy Injector Co.

Cement—Louisville Cement Company
Medusa Portland Cement Co.
Portland Cement Association
Universal Atlas Cement Co.

Cement White
Medusa Portland Cement Co.

Chain Sash—American Chain Co., Inc.
Detroit Steel Products Co.
Smith & Egge Mfg. Co.

Chairs—Marble, B. L., Chair Co.

Channels—Carnegie Steel Co.
Concrete Engineering Co.
Jones & Laughlin Steel Corp.

Church Memorials
American Seating Company

Clamps—Lock Joint
Hyde-Murphy Co.

Clay Vitrified
Clay Products Association

Cleaning Systems
Spencer Turbine Co.

Clocks, Electric
Landis Eng. & Mfg. Co.

Columns, Porches, Etc.
Hartmann-Sanders Co.
Union Metal Mfg. Co.

Compressors—Air
Westinghouse Traction Brake Co.

Concrete Accelerator
Master Builders Co.
Solvay Sales Corp.

Concrete Construction—Reinforced
American Steel & Wire Company
Concrete Engineering Co.
Truscon Steel Company

Concrete Hardener
Master Builders Co.
Sonneborn, L., Sons, Incorporated
Solvay Sales Corp.

Concrete Piling—See Piling—Concrete

Concrete Surface Treatment
Master Builders Co.
Solvay Sales Corp.

Conduit for Underground Heating Pipes
Ric-wiL Company

Conduits
Fibre Conduit Co.
Fretz-Moon Tube Co.
Garland Mfg. Co.

Conduo-Base
Conduo-Base Co.

Copper and Brass
Revere Copper & Brass, Inc.

Copper Sheets
Revere Copper & Brass, Inc.

Cork Covering
Armstrong Cork & Insulation Co.

Cork Tile Flooring
Armstrong Cork Company, Custom Floors Dept.

Corkboard
Armstrong Cork & Insulation Co.

Covering—Pipe and Boiler
Armstrong Cork & Insulation Co.
Johns-Manville Corporation
Ric-wiL Company

Door Closers—Corbin, P. & F.
Norton Door Closer Co.
Sargent & Company

Door and Window Frames
Andersen Frame Corp.

STORE FRONTS

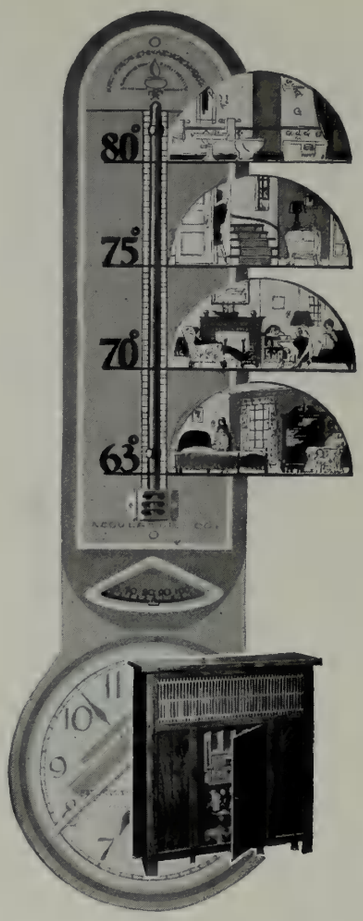


Through years of experience, Kawneer craftsmen have acquired the art of rendering in metal (cast, drawn and extruded) distinctive and efficient store fronts of any size or design. Write for book of outstanding installations.

Kawneer
BRONZE
STORE FRONTS

•

THE KAWNEER COMPANY, NILES, MICHIGAN
KAWNEER MFG. CO., BERKELEY, CALIF. (SUBSIDIARY)
Manufacturers of
RUSTLESS METAL STORE FRONTS, WINDOWS and DOORS



Sensible temperature

NOW each room in the home can be heated at any desired temperature. 80 degrees for the bathroom; 75 degrees for the nursery; 70 degrees for the living room; 63 degrees for the unused bedroom. Sensible temperature.

The Duplex Unit Control Gas Heating System sets the pace for comfortable, sensible, economical home heating. How often have you wished for just such a system to satisfy the demands of your clients?

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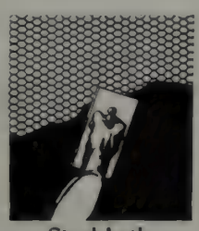
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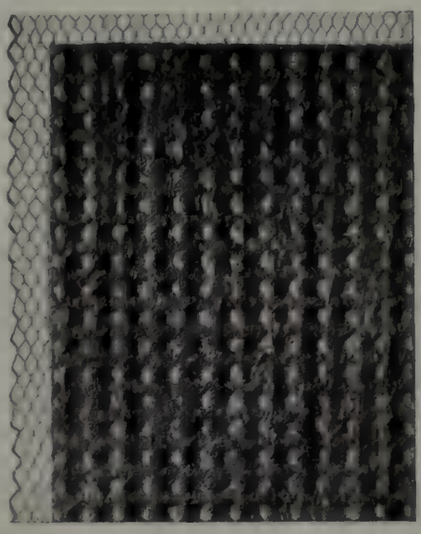


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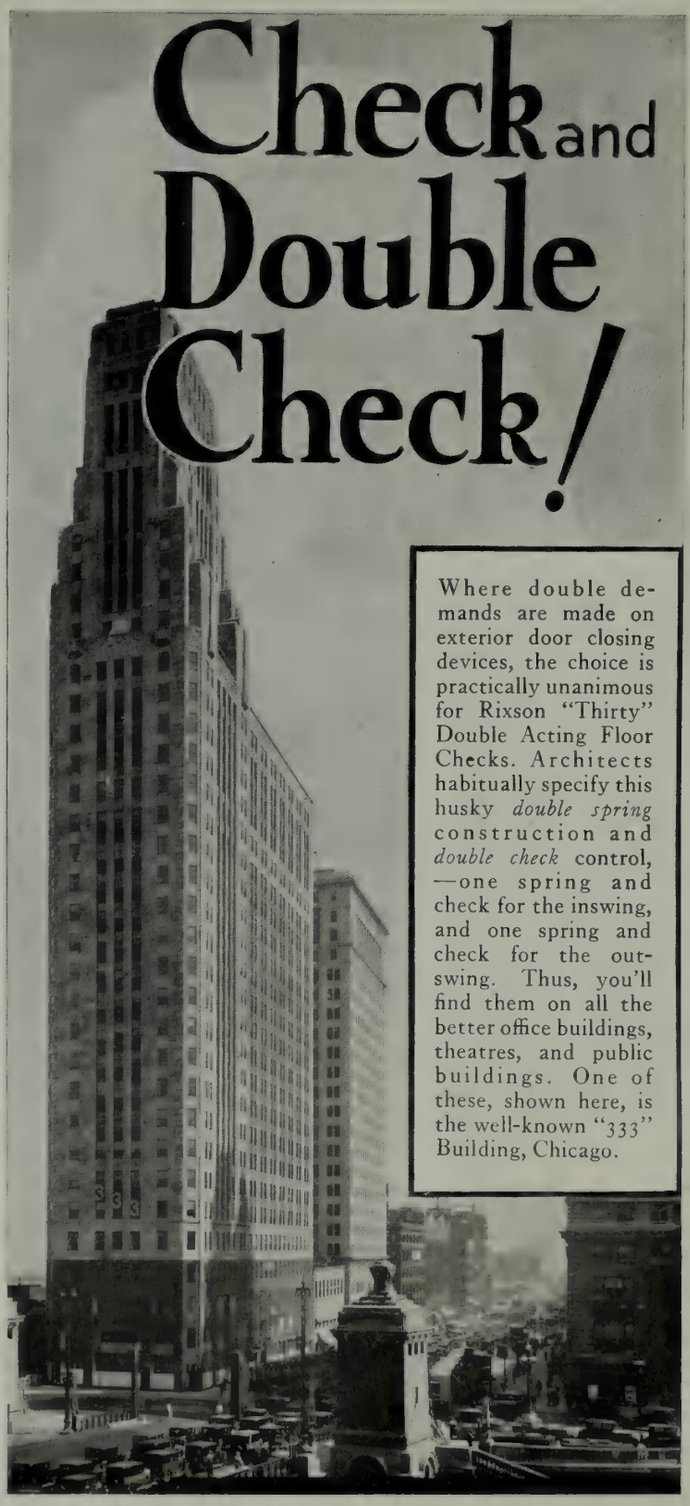
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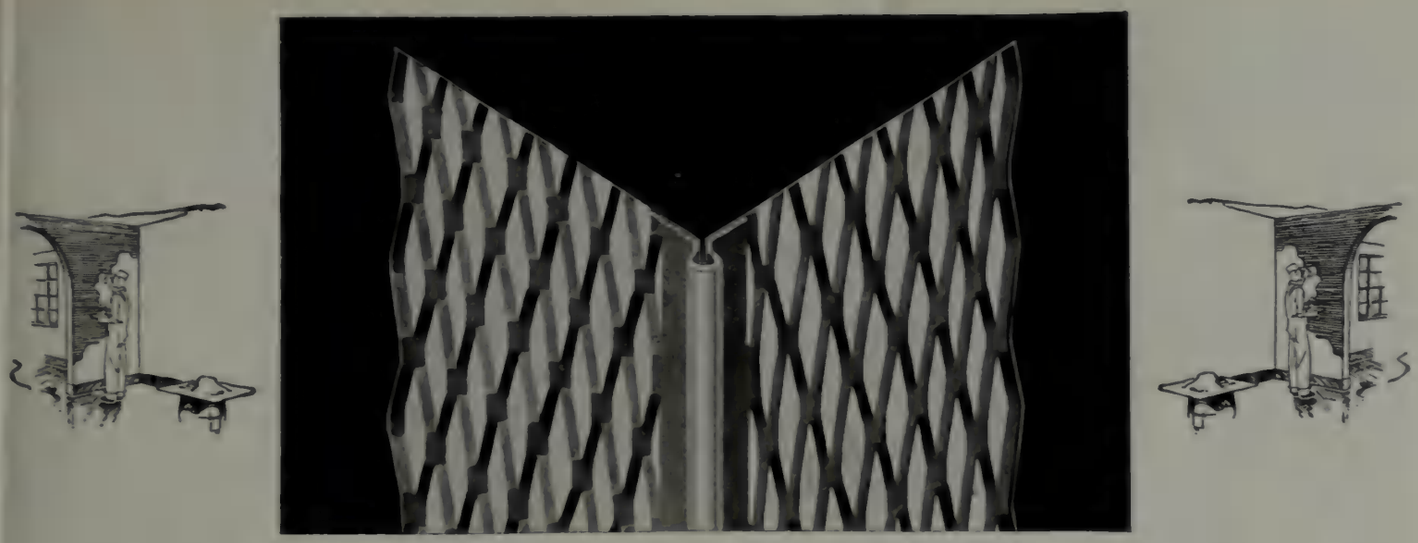
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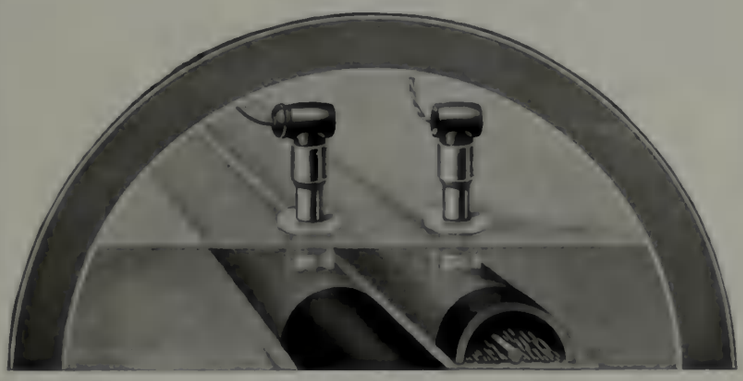
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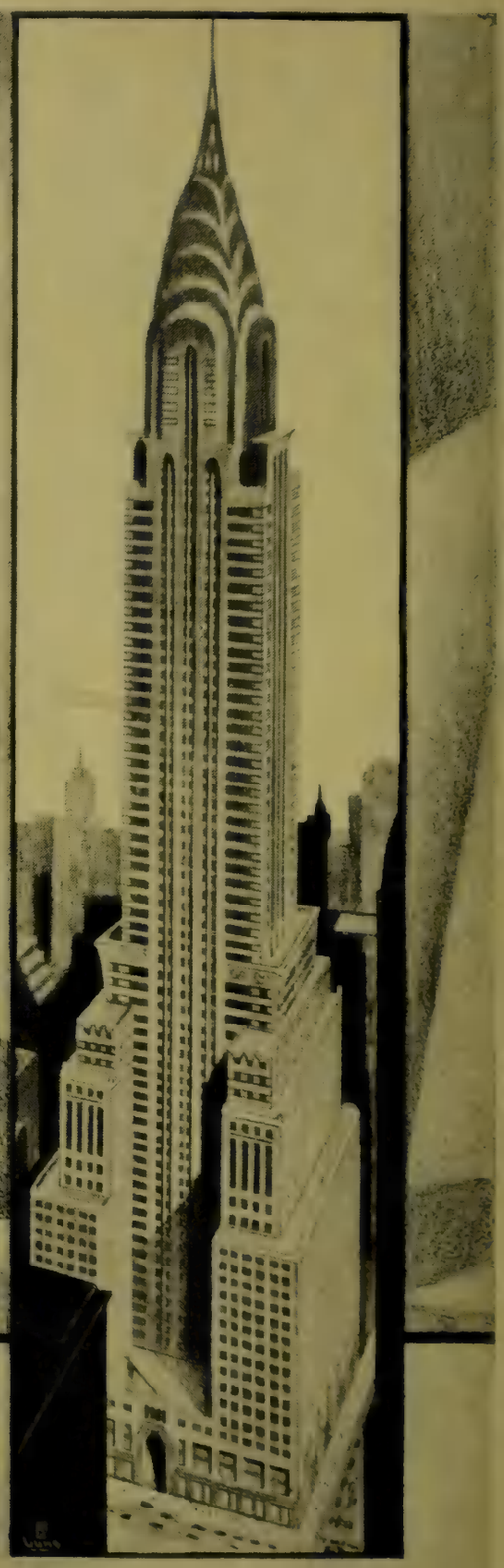
THE ARCHITECTURAL RECORD



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VITROLITE

IN BLACK AND WHITE . . . the newest decorative theme in modern toilet rooms

A NEW beauty of contrasting effects . . . modern in design and color . . . creating an atmosphere of great decorative appeal and yet of unusual simplicity, is finding its way into both old and new toilet rooms in the nation's most modern structures. For now —VITROLITE PARTITIONS may be had in lovely color combinations of deep black and ivory—or pure white—clean, sanitary, impervious to odors or stains.

This fused rock, abreast the new age in design and sanitation, is sought by architects as the one material which, because of its adaptability, inexpensively permits of new ideas and unusual artistic treatments.

Among the exclusive Vitrolite features will be found $1^1/_4$" stiles—no head rail—minimum exposed metal—rigid construction—absolute sanitation.

A brochure of black and white and colored installations, including construction details, will be sent you upon request.

Look for the Vitrolite trade mark on every slab.

Jewel Tea Company Building
Barrington, Illinois
Holabird & Root, Arch.

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THE VITROLITE COMPANY

Room 1103
120 South La Salle Street
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VITROLITE
"BETTER THAN MARBLE"

Factory:
Parkersburg
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REPRESENTATIVES IN ALL PRINCIPAL CITIES IN U.S. AND CANADA



Portion of walls in the Union Trust Company, Detroit, Michigan. *Architects:* Smith, Hinchman and Grylls. *Woodworkers:* Moline Furniture Works.

Modeling in Plane Surfaces

Notable among the tendencies of modern design is the employment of flat surfaces. Gone are the Rococo carvings of yesteryear. Gone, too, are heavy door lintels, dust-catching mouldings half a foot thick, deeply recessed windows, and a hundred other affectations.

Yet with this dominance of the sensible, practical flat surface, architects are faced with the necessity of relieving the monotony of unbroken planes. Many are turning to American Walnut, because of its depth and interest of figure. In the illustration above, flat walls have been given beauty and modeling through careful selection of veneer panels and inlays. Such walls are as modern in tone as tomorrow's sunrise, yet without a trace of monotony. They have depth in appearance without costly and impractical depth in fact.

No other material, no other wood, permits such endless variation of treatment as does American Walnut lumber and veneers. May we co-operate with you in your problems of paneling and interior decoration?

AMERICAN WALNUT

American Walnut Manufacturers' Ass'n
Room 1738, 616 S. Michigan Ave.
Chicago, Illinois

Please send me "The Story of American Walnut."

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STRUCTURAL STEEL CREATED THE SKYSCRAPER

STEEL GIVES DAYLIGHT A CHANCE



"APARTMENT HOUSES OF THE FUTURE." IN THIS IMAGINATIVE DESIGN BY HUGH FERRISS A PROMENADE BRIDGES VEHICULAR TRAFFIC. AN ENLARGEMENT, ON SPECIAL STOCK FOR FRAMING, WILL BE MAILED WITHOUT CHARGE TO ANY ARCHITECT, ENGINEER OR BUSINESS EXECUTIVE.

MIGHTY, modern, adaptable steel . . . it stands alone, needs no bolstering—and when unconcealed by weaker materials brings light and air and majesty to cubist mass, to lance-like tower.

Windows, which in the fledgling skyscrapers were mere slits through heavy masonry, have grown in size and number. Tomorrow, curtain walls will yield to solid-section steel windows, to sheets of glass through which even ultra-violet rays may pass.

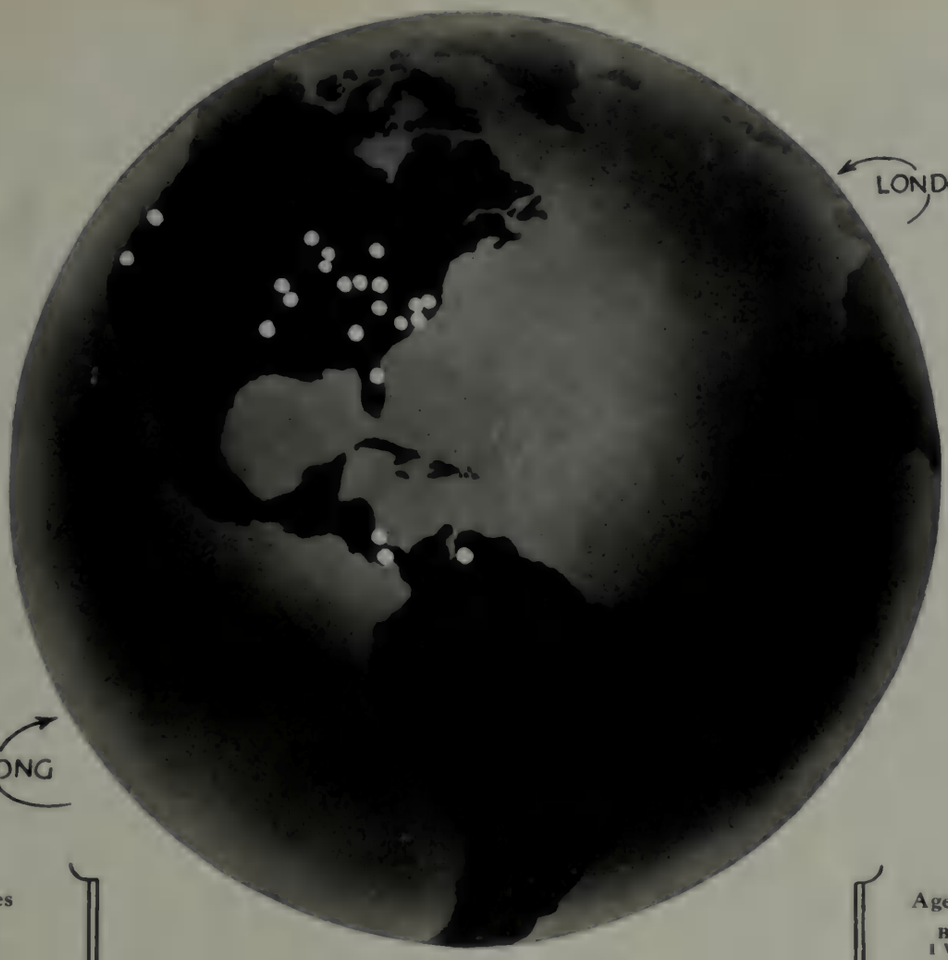
In small as well as large structures, steel is an ally of daylight, of speed, permanence and economy. It permits the most practical design for homes, schools, apartment or mercantile houses, industrial plants and small bridges. Steel has less bulk, greater strength than any other fire-resistive material. It secures more floor space; saves building time and labor; facilitates alterations, additions, removal.

Before building anything, find out what steel can do for you. The Institute serves as a clearing house for technical and economic information on structural steel, and offers full and free co-operation in the use of such data to architects, engineers and all others interested.

The co-operative non-profit service organization of the structural steel industry of North America. Through its extensive test and research program, the Institute aims to establish the full facts regarding steel in relation to every type of construction. The Institute's many publications, covering every phase of steel construction, are available on request. Please address all inquiries to 200 Madison Avenue, New York City. Canadian address: 710 Bank of Hamilton Bldg., Toronto, Ontario. District offices in New York, Worcester, Philadelphia, Birmingham, Cleveland, Chicago, Milwaukee, St. Louis, Topeka, Dallas, San Francisco and Toronto.

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New TRUSCON HEAVY

Thoroughly in keeping with modern requirements of faultless window service.



Double Casement with Transom



Double Casement

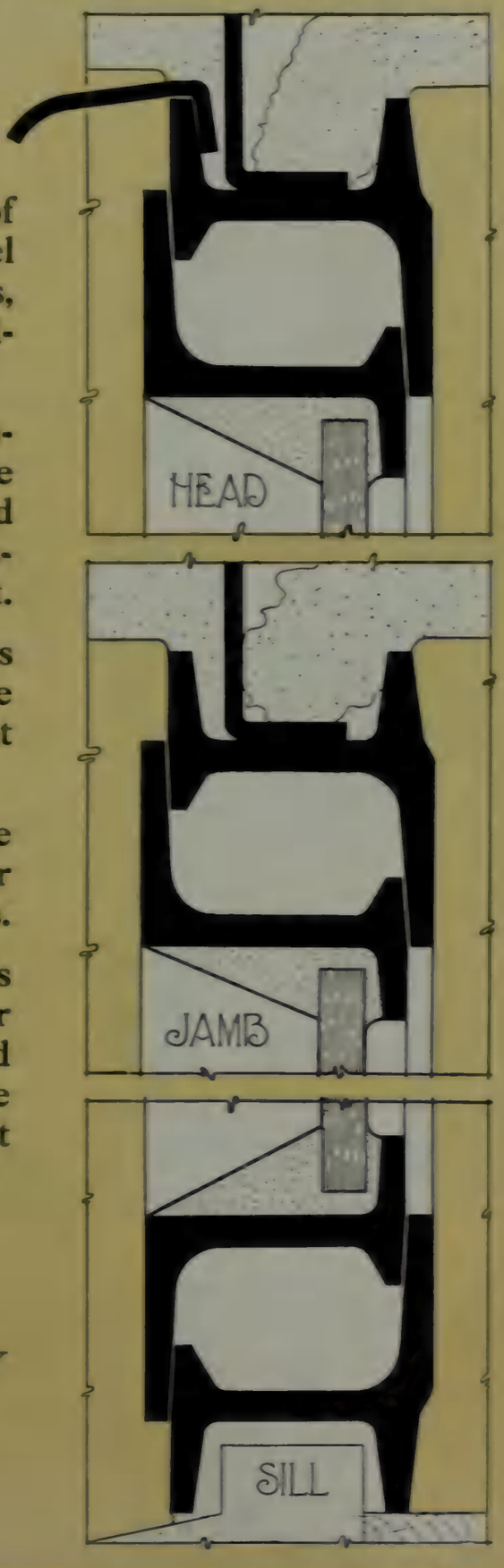


Double Casement with Hopper Vent

Superior Design
The Very Best of Hardware
Prompt Deliveries

STEEL CASEMENTS

TYPE



Truscon announces the development of a new and superior Heavy Type Steel Casement for use in fine residences, public buildings, offices and good buildings of all kinds.

The members throughout are constructed of extra heavy sections. The hardware is solid bronze of improved design. The workmanship and construction represent the last word in steelcraft.

Heavy Type Truscon Steel Casements can be made to open out or in. We recommend as a general practice that casements to open out be selected.

Glazing may be either on the outside with putty or on the inside with either putty or special hot-rolled glazing beads.

The complete line of Heavy Casements includes single or double units, with or without transoms and hopper vents, and with hinged or fixed sash. Units may be combined as desired to meet the exact specifications of architects.

Details and information for application of Heavy Type Truscon Casements to individual projects furnished on request.

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Cypress is favored for *Natural Interiors*

ARCHITECTS and interior decorators find that Tidewater Red Cypress (Coast Type) meets *every* requirement of the smart, modern interior.

Its exquisitely patterned grain combines simplicity with distinction. Its mellow, glowing surface yields a charm found in no other material. And yet, Tidewater Red Cypress is comparatively inexpensive.

And versatile—this Wood Eternal can be stained or varnished, painted or waxed, charred or left in its natural state, always with beautiful effects that never go stale.

No wonder, then, more of it is used every year for panels, doors, beams and trim. No wonder more home-owners every year are enthusiastic in their approval of interiors *whenever* and *however* Tidewater Red Cypress is employed.

A Book of Interiors—sent free

Many noted architects have contributed photographs of their interesting work for this booklet, which well illustrates the beauty and unusual versatility of Tidewater Red Cypress.

For your complimentary copy, address the Southern Cypress Manufacturers' Association, Jacksonville, Florida. If your dealer is not stocked with Tidewater Red Cypress, he can get it for you quickly—or you can write direct to any of the Association Mills listed at the bottom of this page.



Quaker Photo Service

The architect, Mr. Harry Sternfeld of Philadelphia, Pa. employed Tidewater Red Cypress in creating this lovely interior in the home of Mr. W. N. Morice, Flowertown, Pa.

TIDEWATER RED CYPRESS

(COAST TYPE)

THE WOOD ETERNAL

This advertisement is published by the following members of the Southern Cypress Manufacturers' Association, Jacksonville, Fla.:

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AN INSULATING *Concrete Roof Deck*

For the first time in its history, structural concrete has been endowed with the property of insulating against heat and cold.

The cause—

A structure of individual trapped air cells in the Haydite aggregate, that is vitrified, fused shale, impervious and strong.

The result—

A product that resists the passage of heat and cold and which at the same time brings the weight of concrete as low as 10 lbs. per sq. ft. All this with a strength as great as sand concrete — well above all building code requirements.

10 *Pounds* PER SQUARE FOOT



TRAPPED AIR CELLS

in the Haydite aggregate provide the light weight and insulation that distinguish these Featherweight Concrete slabs as foremost in roof value.

Featherweight Concrete INSULATING ROOF SLABS

are providing permanent, fireproof, no-maintenance service on all kinds of buildings—public, industrial and railroad — such as the Adler Planetarium, Chicago—Alexander Gymnasium, Appleton, Wis. — Detroit Municipal Hangar—C. M. & ST. P. R. R.—Oakland Motors—Dow Chemical—and many more. "Catalog and Roof Standards" on request.

Made, Laid and Guaranteed by

FEDERAL CEMENT TILE COMPANY

608 South Dearborn Street Chicago

FOR OVER A QUARTER CENTURY



These Partitions are 100% Salvageable

YES, Sanymetal Office Partitions, built up of sectional units, are 100% salvageable for re-arrangement when changing conditions demand it. No dirt, fuss, noise, or disturbance. Ordinary mechanics can easily take down and re-erect your installation—at low cost.

The steel-and-glass assembly is the last word in partitions, combining both utility and permanently good appearance. Everyone knows the durability of steel—its freedom from cracking, splintering, marring, and warping. Also, the new Sanylene super-enamel finish, soft and lustrous, is the most durable finish we have ever found for steel.

In order to get acquainted with the quiet privacy and distinguished beauty of Sanymetal designs, consult your nearest Sanymetal representative.

Sanymetal steel office and factory partitions are made in four types for every purse and purpose. Sanymetal also builds steel toilet, shower, and dressing compartments, and hospital cubicles. Descriptive folders on request.

THE SANYMETAL PRODUCTS COMPANY

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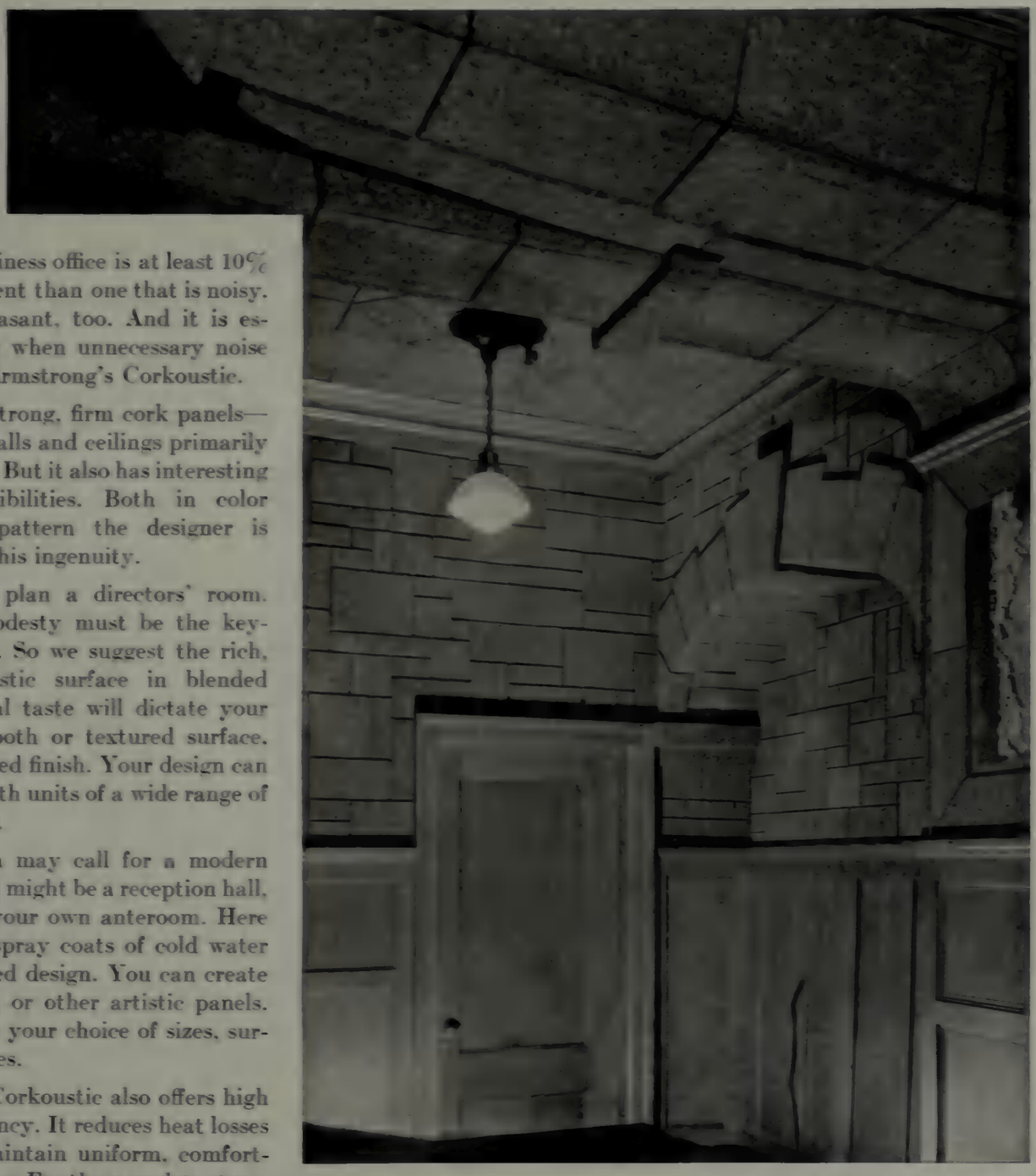
Sanymetal

Steel Toilet & OFFICE PARTITIONS

Noise Does Not Rule...

the Cork Decorated Office

So any modern business room can be built both for beauty and for silence



A QUIET business office is at least 10% more efficient than one that is noisy. Much more pleasant, too. And it is especially friendly when unnecessary noise is subdued by Armstrong's Corkoustic.

Corkoustic—strong, firm cork panels—is installed on walls and ceilings primarily to absorb sound. But it also has interesting decorative possibilities. Both in color harmony and pattern the designer is limited only by his ingenuity.

Suppose you plan a directors' room. Dignity and modesty must be the keynotes, of course. So we suggest the rich, natural Corkoustic surface in blended browns. Personal taste will dictate your selection of smooth or textured surface, beveled or squared finish. Your design can also be varied with units of a wide range of sizes and shapes.

Another room may call for a modern touch of color. It might be a reception hall, an office, even your own anteroom. Here you can apply spray coats of cold water paint in stencilled design. You can create Persian, Gothic, or other artistic panels. Again you make your choice of sizes, surfaces, and finishes.

Armstrong's Corkoustic also offers high insulating efficiency. It reduces heat losses and helps to maintain uniform, comfortable temperatures. For the complete story, send for the book, "Acoustical Correction." Then our engineers will be pleased to consult with you. Armstrong Cork & Insulation Co., 901 Concord St., Lancaster, Pennsylvania.

Corkoustic can be easily applied direct to walls and ceilings to harmonize with the decorative style of any business office.

Armstrong's

CORKOUSTIC

Armstrong's (A) Product

Sound Quieting and Acoustical Treatment for all buildings







ALL the individual character of the architect's design, no matter how rhythmic the flow or modern the conception, can be faithfully reproduced in terra cotta. For symbolic figures and other forms of enrichment expressing the most cherished ideals of the American School, terra cotta is an exceptionally sympathetic material. The living, breathing spirit of the ornament is fully retained, as approved in the original model. Each unit, either in white or in full color, can be repeated without the slightest loss of feeling. Every detail is true to the creative impulse which transformed it from a lump of clay into a thing of lasting beauty.

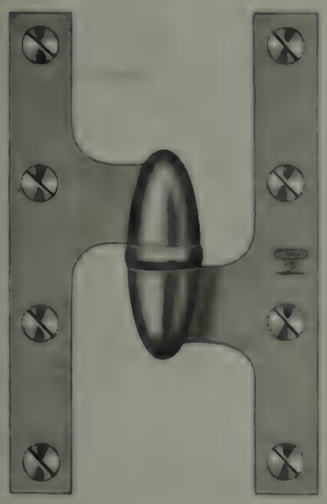
Entrance detail is in NORTHWESTERN TERRA COTTA Color, Light Brown Mottled. School of St. Thomas the Apostle, Chicago. Architects: Shattuck & Layer.

THE NORTHWESTERN TERRA COTTA COMPANY

DENVER · CHICAGO · ST. LOUIS

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STANLEY BALL BEARING HINGES

PERMANENCY

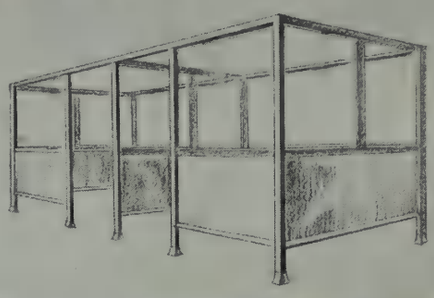
THE DOORS of the Cook County Criminal Court Building swing on Stanley Ball Bearing Paumelles. This is but another way of saying that the doors are equipped to assure smooth, trouble-free operation for the life of the building.

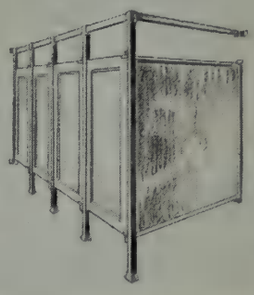
Eric E. Hall, Cook County Architect, by his specifications of Stanley Ball Bearing Paumelles, has saved the occupants of this building from the annoyance of hinges that squeak or doors that sag and bind.

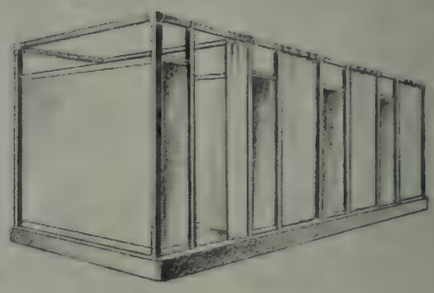
Our "Architects Manual of Stanley Hardware" is in daily use in thousands of architects' offices. Have you a copy?

THE STANLEY WORKS
New Britain, Conn.

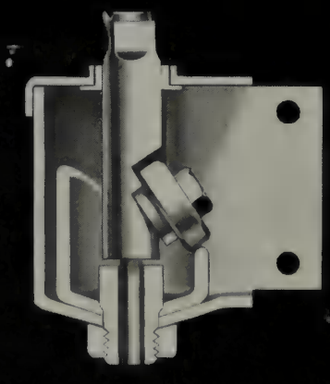
Further WEISTEEL Evidence of Superiority











WEISTEEL Compartments are equipped with Weis specially designed hardware parts and the WEIS Universal Gravity Hinge assembly. This hardware is the result of long experience and untiring development.

Notice the cross section of the hinge reproduced at the left. It is completely enclosed and fool-proof. Due to its ingenious design it provides, at all times during operation, geometrical continuity of contact between the roller and its race.

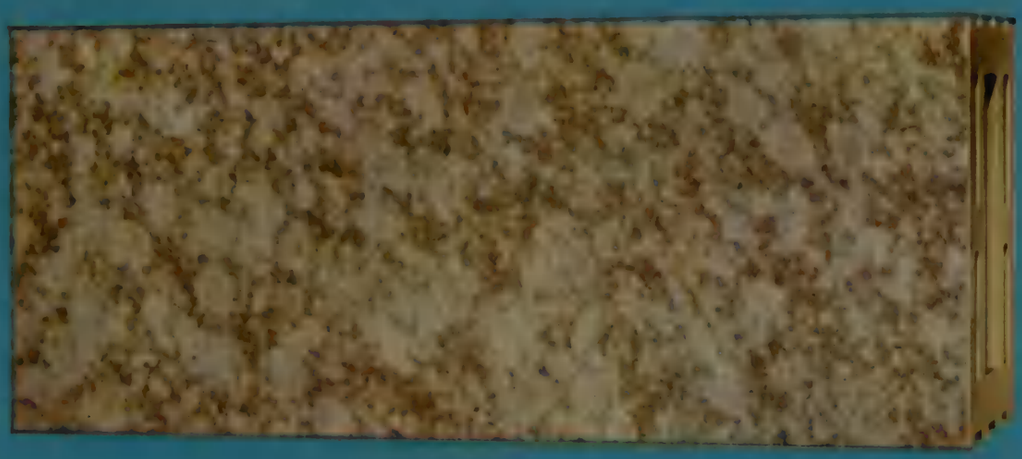
This is but one instance of the thorough going way in which WEIS designers and builders have functioned to provide the utmost in service and satisfaction in toilet compartments.

The exclusive WEIS V-Rail reinforcement, ingenious door construction, the fact that posts and panels are inter-locked *and* welded---all these give you greater assurance of satisfaction to the owner of the building.

HENRY WEIS MANUFACTURING CO., INC.
ELKHART, INDIANA

You will find complete catalog in Sweet's 1930 edition, following page B-2388. Turn to it now.

NATCO *FRITTED GLAZE* VITRITILE NOW OFFERS A NEW MEDIUM OF EXPRESSION TO ARCHITECTS



FRITTED GLAZE-A PLEDGE OF PERMANENCE

NEW fields of color composition, color harmony, are open with the advent of Natco Fritted Glaze Vitritile. The comprehensive line of structural units, suitable for interior or exterior walls and partitions, are painted with flame into beautiful luminous matt whites, striking blacks, and seven delightful and unique mottled effects, ranging through cream tans and cream browns.

Beautiful When Installed—the Beauty of this New Material Endures

The Natco Fritted Glaze process, scientifically developed, is a pledge of permanence. The glaze is as permanent as that on the finest English Glazed Brick—the standard of excellence in materials of this type.

SEVEN MOTTLED SHADES

8530-L



NATCO FRITTED GLAZE VITRITILE
OPENS NEW FIELDS OF COLOR COMPOSITION AND HARMONY

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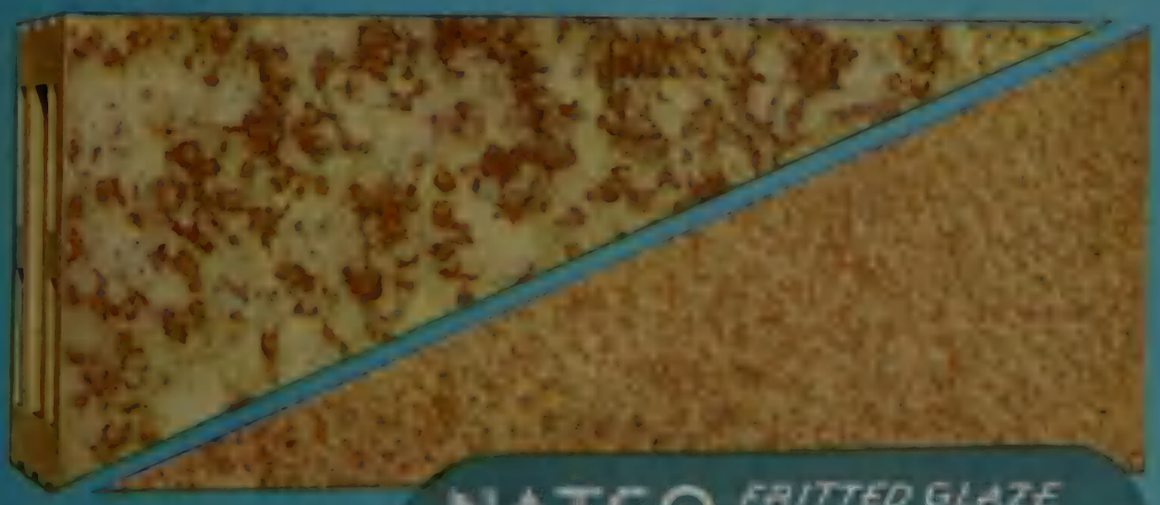
NATCO FRITTED GLAZE represents the successful culmination of a determined attempt to produce a glaze so permanent—so impervious—so immune to the destructive agencies of time, the elements, chemical attack, staining, checking, and crazing—that it will easily meet the most exacting requirements. The fritted glaze process is the most effective method science has devised of holding, crawling, peeling, blistering, cracking and pinholing to a miscroscopic minimum.

Tests and experiments early disclosed that the ordinary processes of raw mixing, spraying, and kiln-burning which are in common use were powerless to attain these ideals. Only by the scientific fritted glaze process could they be realized.

Natco's frit is made of a number of various compounds, which are mixed, melted at 2300°, chilled and then ground to an impalpable powder. This powder represents a **new** and homogeneous compound, which melts at a much lower temperature. The successive coats of glaze material (sometimes as many as 7) are applied to the tile on a patented "G Mottling" machine, developed by a ceramic expert. This machine does its

SEVEN MOTTLED EFFECTS

8520-L



8520-S

NATCO *FRITTED GLAZE* VITRITILE
IS FURNISHED IN A COMPLETE
VARIETY OF SHAPES AND SIZES



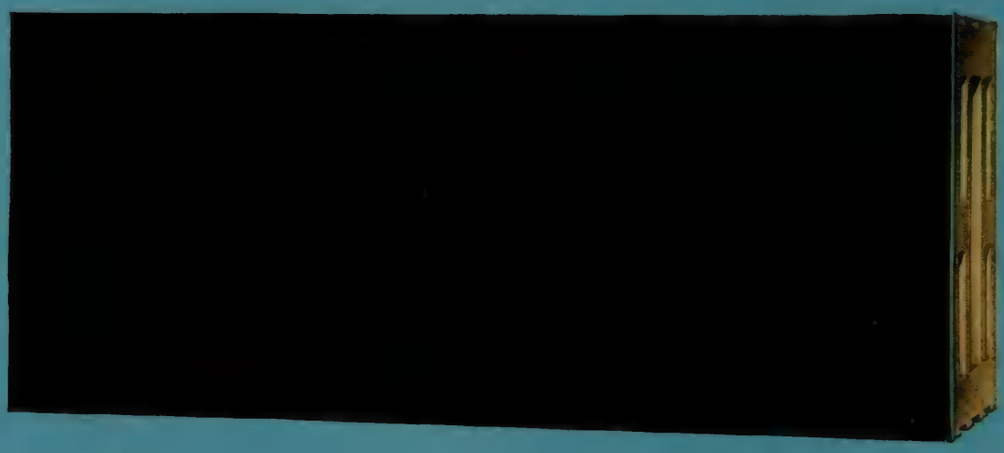
8535-L

work with absolute precision, substituting for the uncertainties of makeshift methods unvarying excellence of results. When the tile is kiln-burned, the frit causes the glaze to mature at a lower temperature; form a more intimate bond with the tile; give—because the various elements have been pre-melted, instead of merely fused, together—more uniform results; and yield a silica glaze equivalent to that on the finest English glazed brick—the accepted standard of excellence.

Colors are prepared in the same painstaking, scientific way. Instead of merely mixing a dye-powder with the glaze, Natco utilizes **calcined** colors; the various compounds required to produce the desired shade are blended, burned, wet-ground and the resulting powder screened, before it is added to the glaze. Color variation is thus reduced to a minimum.

The added care needed, the added expense, of the scientific Natco Fritted Glaze process is abundantly justified in the increased service, the assured satisfaction, the well-founded confidence that Natco's product offers to the user. Fritted glaze is a triumph of the ceramic art, a pledge of permanence to you.

In MATT FINISH BLACK AND WHITE



BLACK



WHITE

Natco Fritted Glaze Vitritile

For Permanent Walls of Enduring Beauty

EXTERIOR USE

THE calcined colors and fritted glazing of Natco Fritted Glaze Vitritile are prepared by a scientific process, and then are **fired** in, making them immune to acids, to alkalis, to the attack of the elements. The most striking effects may be obtained through this material and the effect will endure year after year with no decrease in attractiveness

INTERIOR USE

Beautiful, colorful finishes, hitherto obtainable only through costly decorating, now can be built into the wall. Instead of being faced with the necessity for frequent redecoration, the owner has a wall finish that will last as long as the wall itself. Dirt will not harm it, acids will not affect it. The glass hard fritted glaze repels dirt, is easily cleaned and kept clean.

Coming!
NATCO VITRIBRIK

The architects' cry for a new brick unit will soon be answered. Natco Vitribrik, shortly to be introduced, will offer a brick twice the height of the present standard. Its face will be finished in a beautiful and permanent salt glaze, which resists all agencies of destruction. Watch for the announcement, soon to come.

NATCO

THE *COMPLETE* LINE *of* STRUCTURAL CLAY TILE

NATIONAL·FIREPROOFING·CORPORATION

THE LARGEST CONCERN IN THE WORLD MAKING A COMPLETE LINE OF STRUCTURAL CLAY PRODUCTS

GENERAL OFFICES: FULTON BUILDING, PITTSBURGH, PA. BRANCHES: NEW YORK, CHANIN BUILDING; CHICAGO, BUILDERS BUILDING; PHILADELPHIA, LAND TITLE BUILDING; BOSTON, TEXTILE BUILDING — NATIONAL FIRE PROOFING COMPANY OF CANADA, LTD., TORONTO, ONTARIO

Should the description be changed?

A roof of Sheldon's Slate has, rightly, been called "the roof of eternal beauty."

Time, however, not only fails to deteriorate this eternal stone, but its caresses cause it to grow in loveliness. Even short periods of time mark an enhancement in beauty that can not escape attention.

A case in point is the First Methodist Church of La Porte, Indiana, a structure of Indiana Lime Stone all around, containing forty-eight rooms and costing $350,000, admired alike by citizens and visitors.

It is crowned with a roof of Sheldon's Semi-Weathering Green and Gray Slate* (shown in colors in Sweet's) and in a letter that lies before us Mr. George W. Allen, of George W. Allen and Sons, the Architects, says, significantly:

"That roof was put on in 1928, and I wish you could see it now. Time and the weather have made it so much more soft and beautiful in color!"

A common experience, which has led to the suggestion that a Sheldon Slate Roof would be better described as "the roof of eternally *increasing* beauty."

Haven't you, on the boards or contemplated, a project good enough for such a roof? If so, permit us to help you to develop one that will be a credit to you, an everlasting joy and profitable investment to the owners, and eternally increasing in beauty to all who observe it.

*Laid by Frank Laidlaw, Elkhart, Indiana



F.C. SHELDON SLATE CO.

GENERAL OFFICES · GRANVILLE · N·Y·

· BRANCHES IN PRINCIPAL CITIES ·

RCA VICTOR BUILDING

NEW YORK



ARCHITECTS: CROSS & CROSS

THIS MODERN 55-story office structure at 570 Lexington Avenue now being erected by A. L. Hartridge Company for the Bartholomew Building Corporation will be equipped throughout with metal doors, trim and

Elevator Entrances by

DAHLSTROM

THE DAHLSTROM METALLIC DOOR COMPANY, JAMESTOWN, NEW YORK
WITH OFFICES AND REPRESENTATIVES IN PRINCIPAL CITIES



Acoustone Ceiling, Trust Department, Northern Trust Company, Chicago. Frost & Henderson, Chicago, Architects.

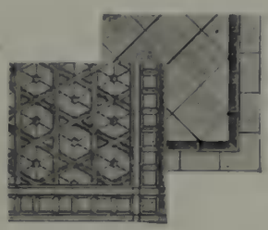
A Solution to the Difficult Problems in Architectural Acoustics

WHILE the problems in Architectural Acoustics have always been perplexing, the demand for comfortable noise levels has grown so rapidly that many architects realize, more than in the past, the need for an organization which can take full responsibility for the acoustical phases of its assignments.

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For jobs requiring reduction or complete elimination in the transmission of noise from one room to another, the USG System of Sound Insulation and USG Insulative Doors are employed. For the absorption of noise within the room in which it is created and for the correction of acoustical conditions in auditoriums, churches, theatres, and other public buildings, Sabinite Acoustical Plaster, or Acoustone, the USG Acoustical Tile, is usually prescribed.



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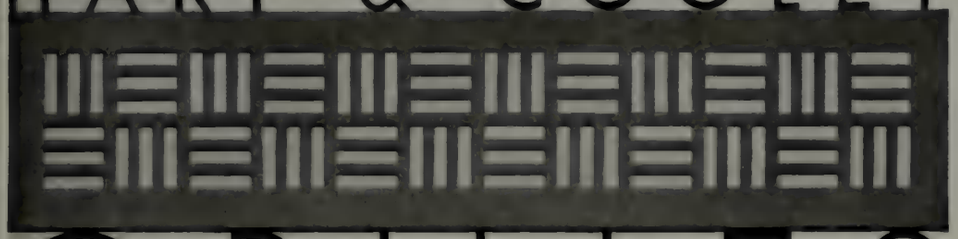
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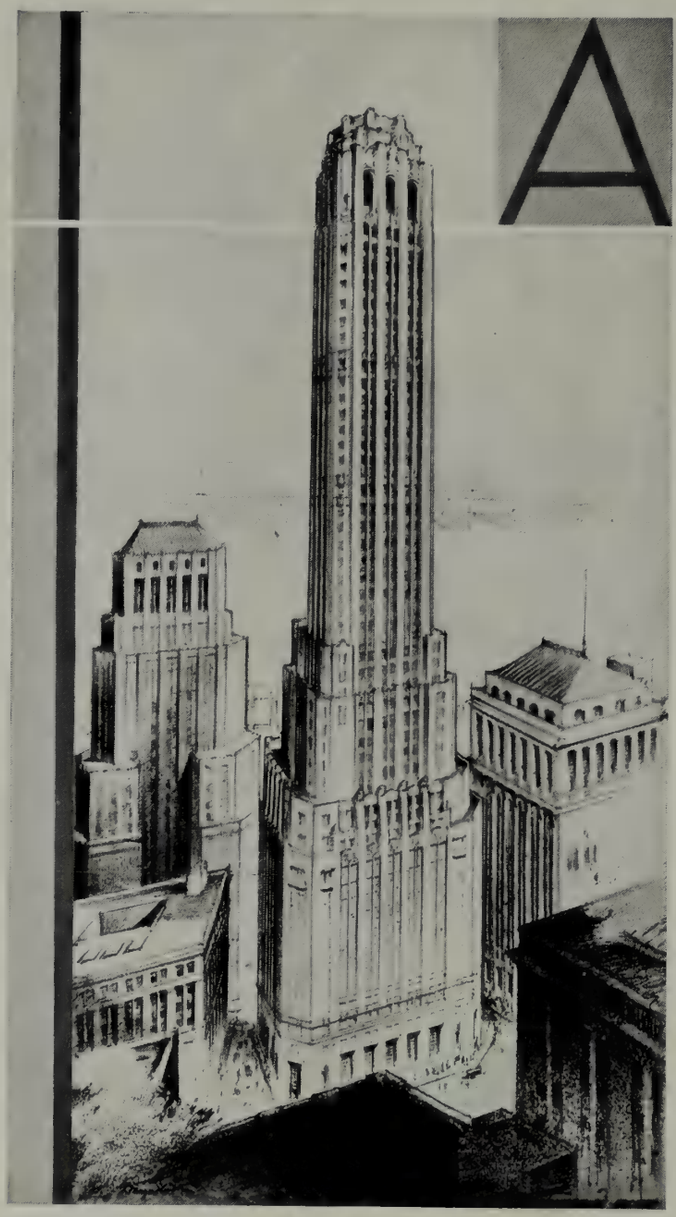


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GRILLES

Above is shown the illustration of the Merchandise Mart, Chicago. Architects: Graham, Anderson, Probst & White, Chicago. General Contractors: John Griffiths Sons Co. Heating Contractors: Robert Gordon, Inc., Chicago. Highton, Hart & Cooley Grilles in design No. 589 (shown above) were selected for this internationally famous building.

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Alcoa Aluminum Spandrel Base with decorative ornament set in position over vent opening. Spandrel 4 ft. 5½ in. x 4 ft. 11¾ in. Weighs 116 lbs.

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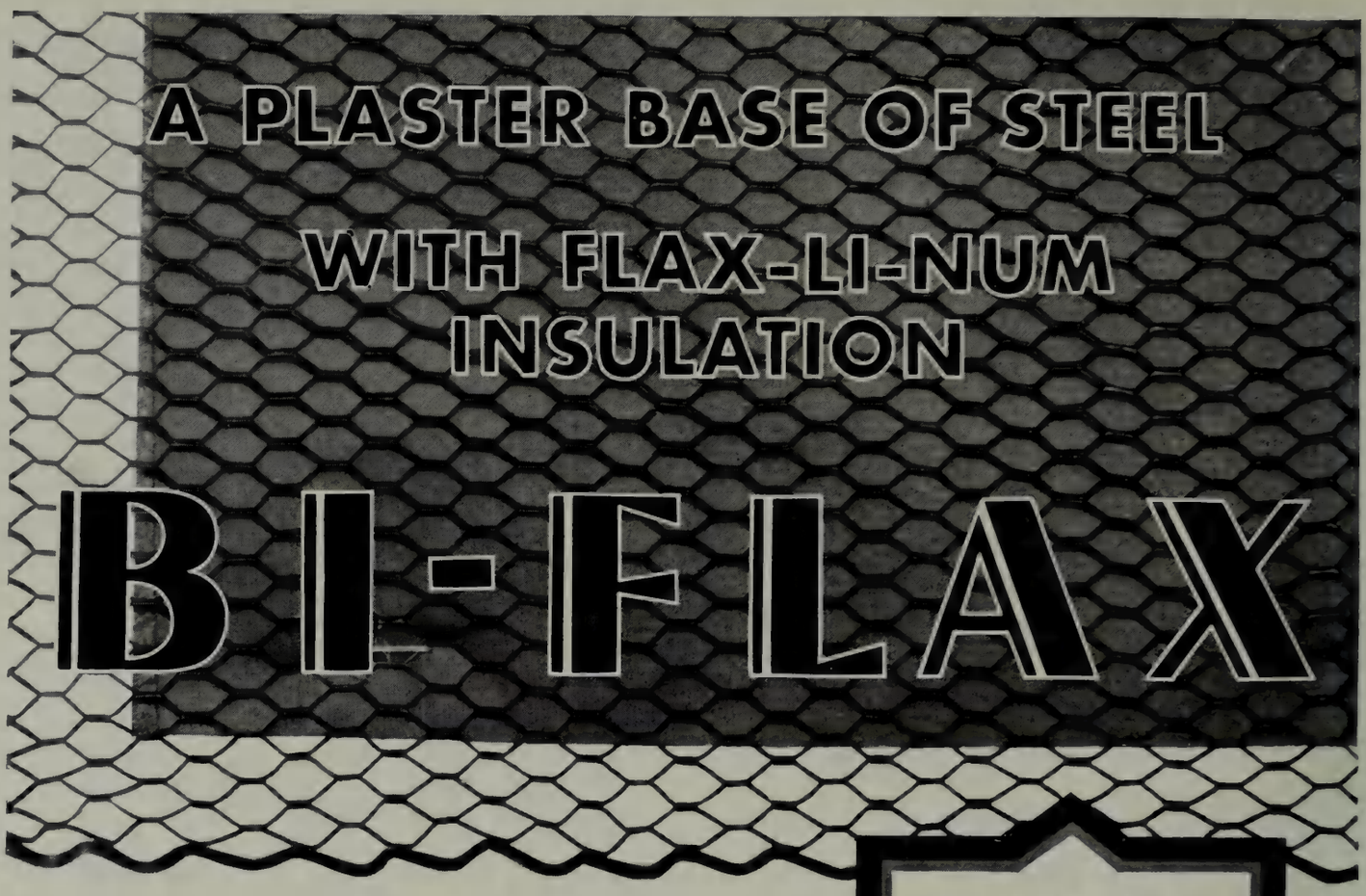


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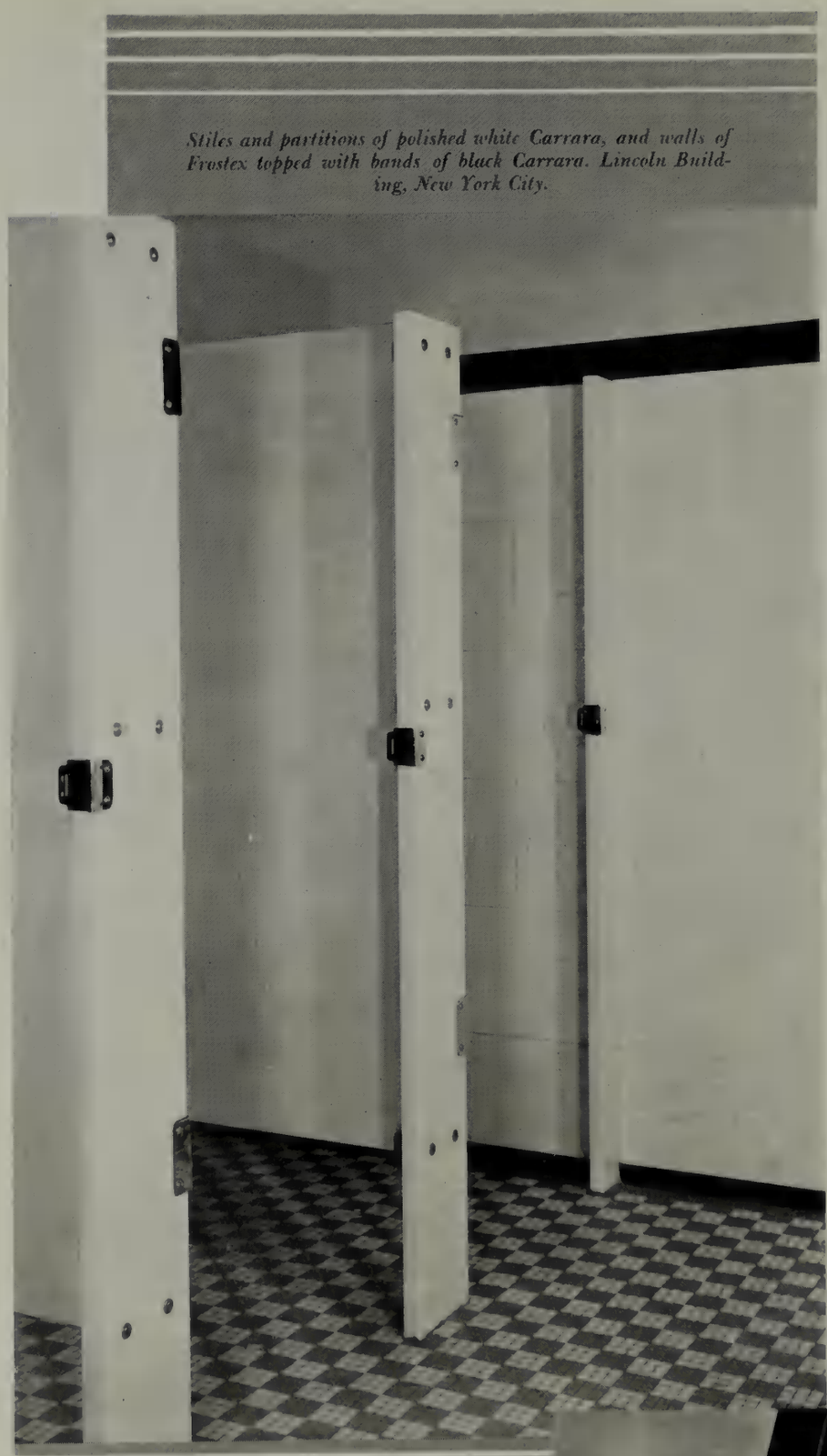
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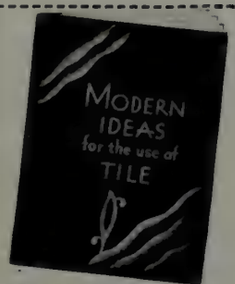
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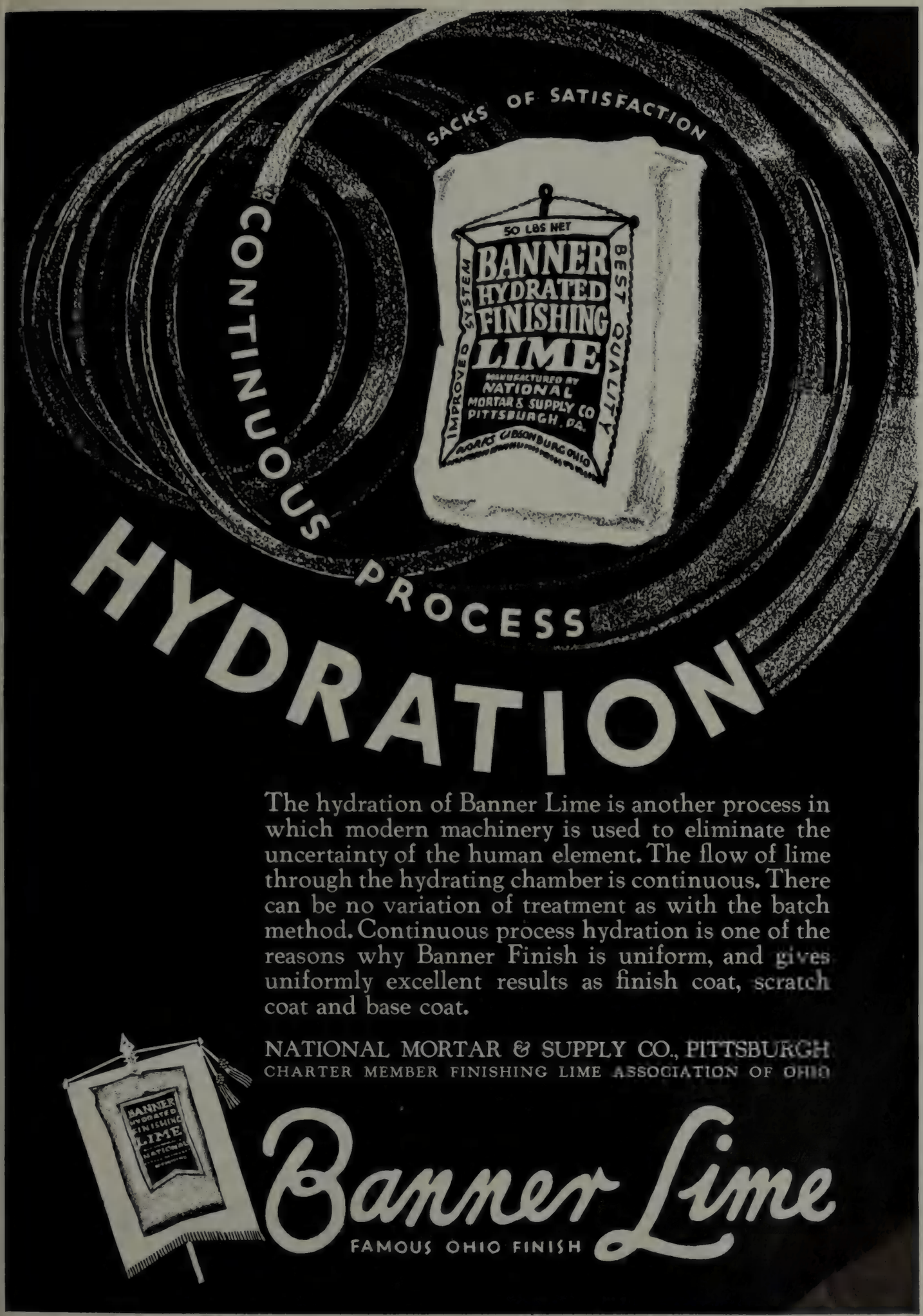
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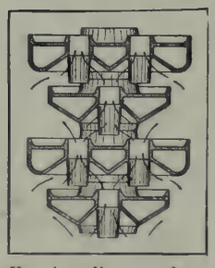
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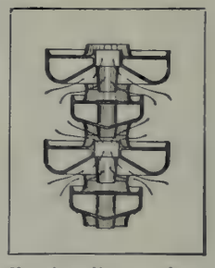
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Port Orford Cedar resists acid and soil decay, and is widely used for garden furniture, porch columns, entrances, boat and aircraft building; bulkheading, decking, tunnel lining, loading platforms. Non-warping, this wood is ideal for Venetian Blinds, built-ins, etc.

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Please send me free your book "Port Orford Cedar—Its Properties and Uses"; also "Beautiful Interiors with Port Orford Cedar" by Wade Pipes, A.I.A.

Name_____

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Walking Safety for Hurrying Crowds—

Even in those places where liquids are spilled







Architect: Horace Trumbauer, Philadelphia

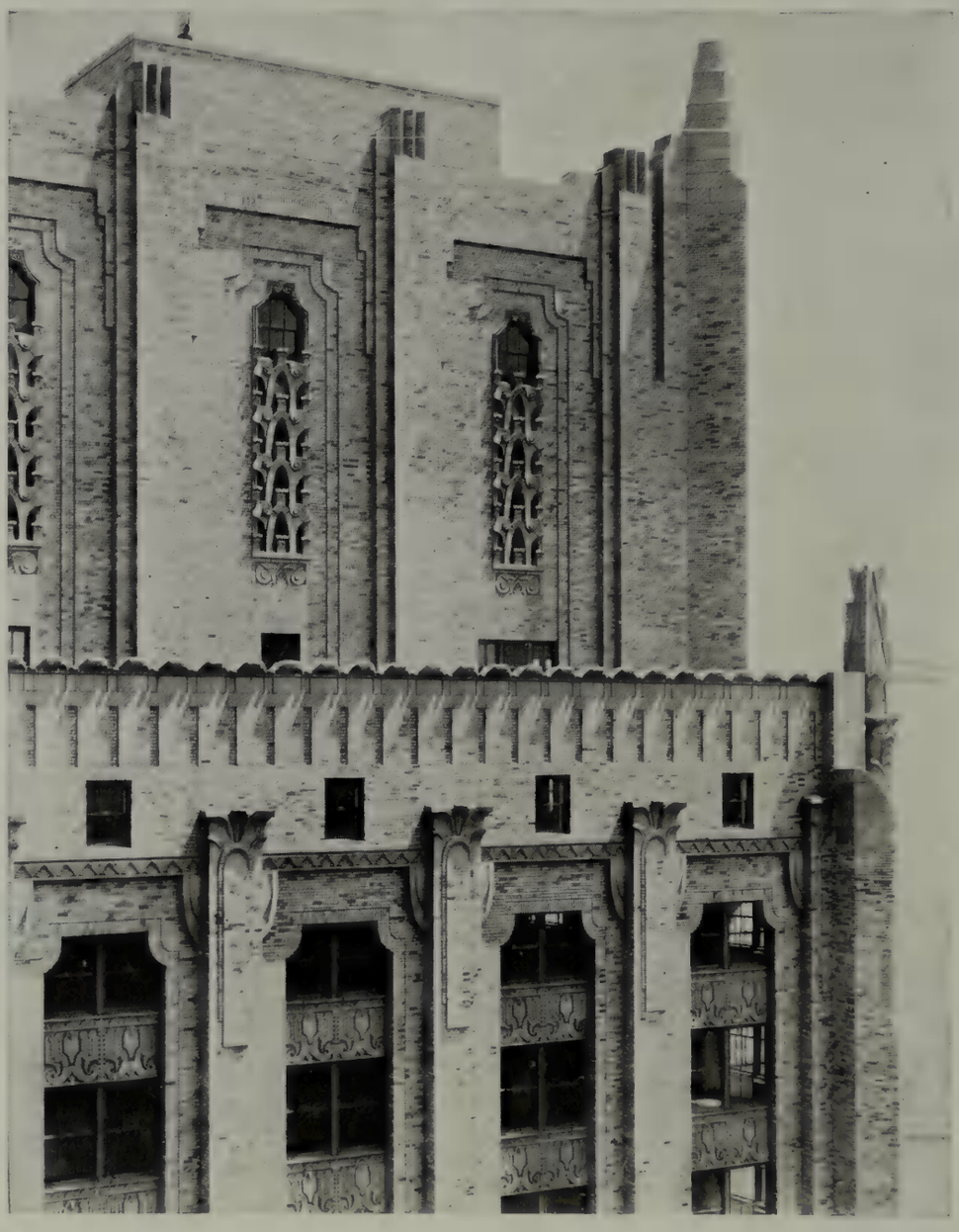
NORTON FLOORS
Alundum Tiles, Treads & Aggregates

SAFETY for hurrying, rushing crowds has been the keynote in this North Broad Street (Philadelphia) Station of the Reading Railroad. Alundum Aggregate in the terrazzo of the main waiting room, the barber shop, the lunch and dining rooms, the lavatories and the public telephone and telegraph room assures a permanently non-slip floor—even in those areas where liquids are frequently spilled.

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FEDERAL SEABOARD TERRA COTTA



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NEWARK, NEW JERSEY
Frank Grad Architect
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6¾" oak floor block

This unit wood floor block, *CELLized, now provides a design floor both beautiful and durable. Unexcelled for offices, hotels, ball-rooms, clubs, display rooms, public buildings, hundreds of uses for which a design wood floor has hitherto been too expensive.



Style, permanence, comfort under foot, lowest upkeep cost — all combined in a floor of unique beauty. Each block is a complete unit laid in EVERBOND, a plastic cement, without nails, directly over concrete or wood subfloor. The floor is sound deadening as EVERBOND is a non-vibrating medium. Each block is *CELL*ized* to reduce the tendency toward distortion. Protects against decay. Blocks are available in oak, beech, maple, red gum, walnut, and Philippine mahogany, in squares and rectangles, several sizes.

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Display room of John T. Fisher Motor Company, Memphis, Tenn.



*Laying *CELL*ized oak floor blocks in* EVERBOND *over wood subfloor, in a Chicago office building.*



Ball room of the Dallas Athletic Club, Dallas, Texas.

Combinations of woods, square and rectanglar units, are installed also for walls and ceilings. Write for suggestions as to novel uses.

*CELL*ized* wood floor blocks are guaranteed by *CELL*ized* Oak Flooring Inc., when laid by Licensed Flooring Contractors. The names of those licensed to use this label in your locality will be supplied upon request.

LICENSED
UNDER PATENTS OWNED BY
*CELLized Oak Flooring INC.
MEMPHIS TENNESSEE
FLOORING CONTRACTOR

See our catalog in Sweet's; Vol. B, pages 2173 to 2175.

*CELL*ized wood floor blocks are sold through lumber dealers everywhere; manufactured by*

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Playing an important part in this progress—enabling the successful development of plans—is American Steel & Wire Company Wire Fabric (the steel backbone of concrete).

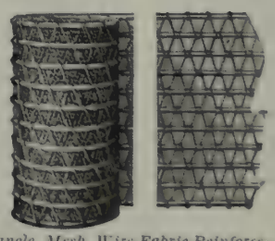
Recognized as the most efficient and economical means of concrete reinforcement, this product is in general use throughout the nation. An evidence of interest on your part will bring detailed information and literature.



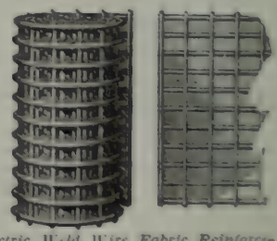
The Carew Tower, Cincinnati, Ohio—Walter Ahlschlager, Architect, Chicago—Delano & Aldrich, Associate Architects, New York—Starrett Building Co., Contractors, Chicago—Lieberman & Hein, Consulting Engineers, Chicago



Wire Fabric being laid on floors of Carew Tower



Triangle Mesh Wire Fabric Reinforcement. Furnished in rolls or sheets.



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A distinctive decorative achievement ...*the* Silver Grill *of the New* Hotel Lexington



The Hotel Lexington, New York. Architects: Schultze & Weaver.



Silver Grill Room of new Hotel Lexington. Painted with Dutch Boy White Lead and Flatting Oil by Barker Painting Company, New York City.



DECORATED with DUTCH BOY WHITE LEAD *and* FLATTING OIL

DISTINCTIVE... different... beautiful! The Silver Grill of the new Hotel Lexington is an achievement in decorative art.

Dutch Boy white lead, mixed with flatting oil, was used not only in the decoration of the Silver Grill, but in all the bedrooms, and parlors of the hotel. The rich, artistic finish this flat paint produces, as well as its extreme durability and washability, explains the preference it enjoys in modern buildings everywhere.

Another advantage of white lead as a paint material is its great adaptability. White lead is used for mixing *every* type of paint—to obtain durable, economical paint for wood, plaster, wall board or metal... undercoatings for enamel... blended or mottled effects... and to produce the plastic paint that gives the new low-relief textures now so much in vogue for lobbies and entrances.

Let us send you booklet, "Decorative Possibilities of Paint", which describes the modern finishes Dutch Boy helps to produce. We shall also be glad to send you a book containing formulas for all coats and finishes. Address branch office nearest you.



The well-known brand of Carter White Lead is also made by the National Lead Company. In purchasing either Carter or Dutch Boy White Lead, the buyer is assured of obtaining white lead of the highest quality.



DUTCH BOY WHITE LEAD

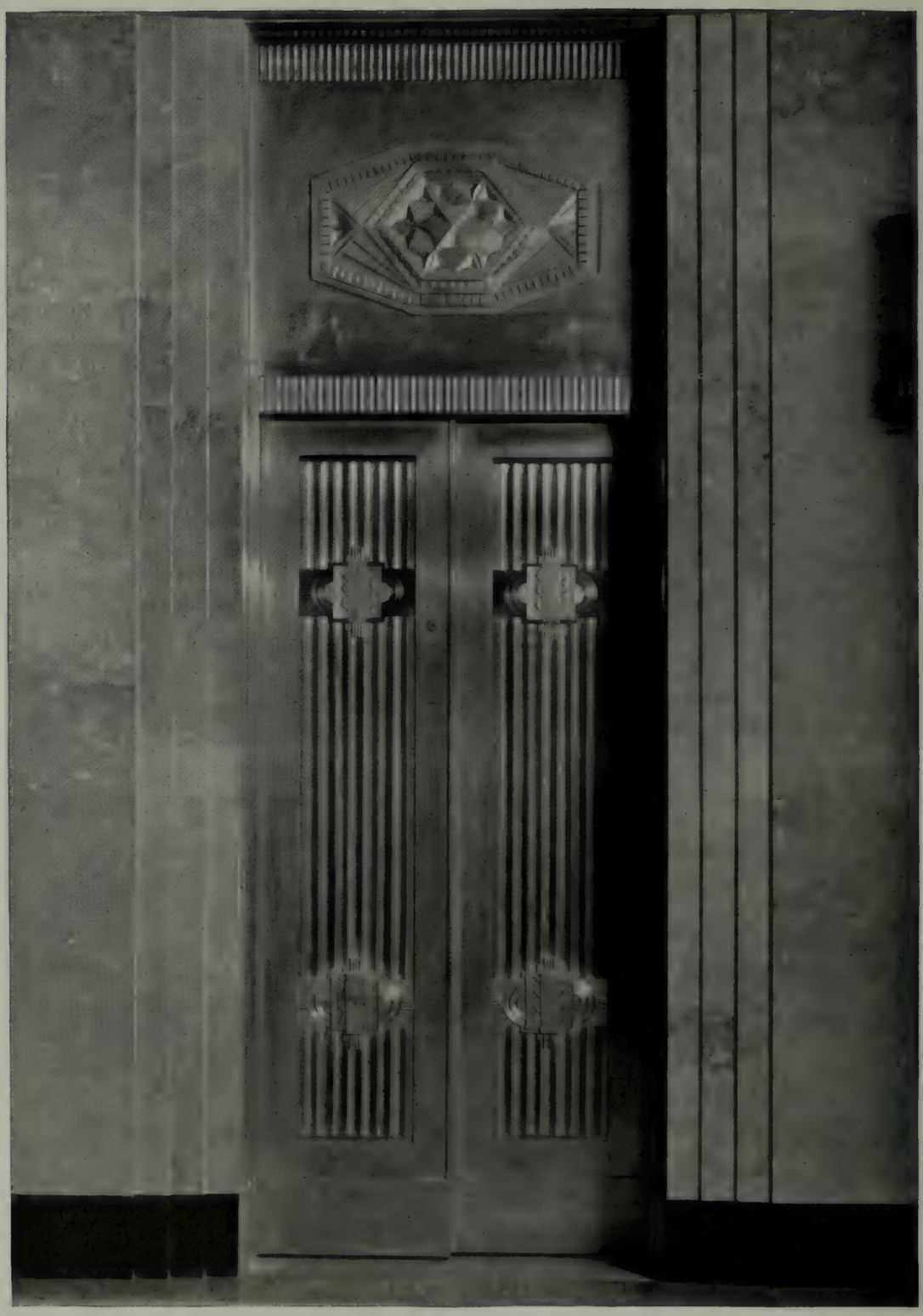
"Save the surface and you save all"

NATIONAL LEAD COMPANY

New York, 111 Broadway; Buffalo, 116 Oak St.; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Ave.; St. Louis, 722 Chestnut St. San Francisco, 2240—24th St.; Boston, National-Boston Lead Co., [redacted] Albany St.; Pittsburgh, National Lead & Oil Co. of Pennsylvania, 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., Widener Building.



Typical parlor of suite in Hotel Lexington, painted with Dutch Boy White Lead and Flatting Oil.



FOYER OF R. J. REYNOLDS BUILDING, WINSTON-SALEM, N. C. DETAIL OF ELEVATOR DOOR OF ANACONDA NICKEL SILVER FABRICATED BY W. S. TYLER COMPANY. SHREVE & LAMB, ARCHITECTS

THE VARIOUS ALLOYS OF ANACONDA NICKEL SILVER ARE PARTICULARLY SUITABLE TO MODERN INTERIOR OR EXTERIOR DESIGN. BRILLIANT AND SILVERY IN APPEARANCE, YET WORKABLE INTO THE SIMPLEST OR THE MOST INTRICATE MOTIF. TEXTURE AND COLOR ARE UNIFORM. ANACONDA NICKEL SILVER IN RODS, BARS, SHEETS, DRAWN SHAPES AND CASTING INGOTS MEET ALL REQUIREMENTS OF LEADING FABRICATORS OF ORNAMENTAL WORK. THE AMERICAN BRASS COMPANY, GENERAL OFFICES, WATERBURY, CONN.

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to harmonize with your plans

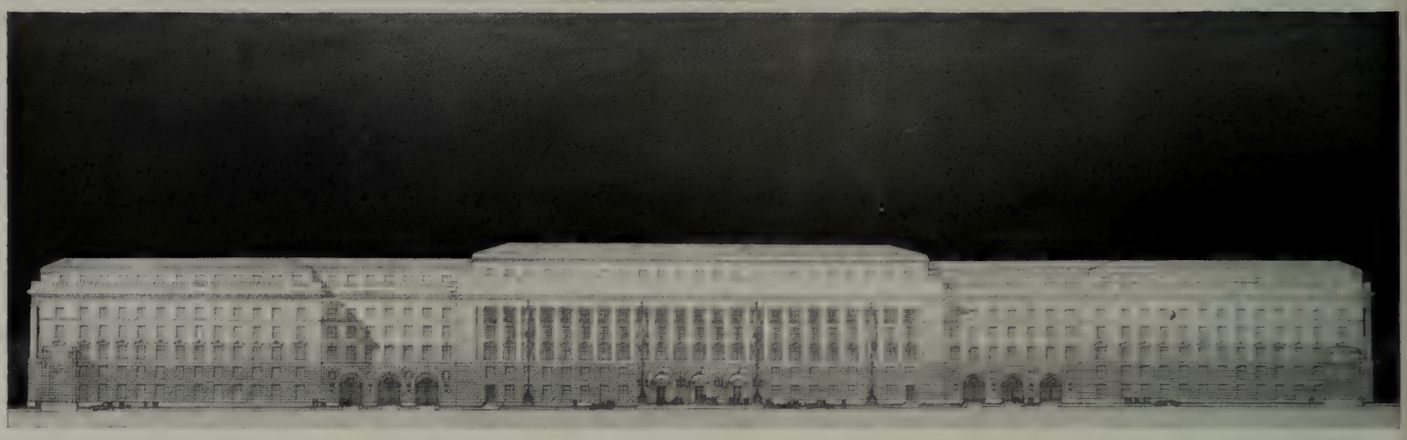
So versatile are King Greenhouses that in many instances they have been added as an after-thought to the original plans with a thoroughly artistic result . . . It is not necessary, ever, to "make room for a King"! A King house will find a place which just seems to be awaiting it . . . Of light, durable construction gracefully designed, King Greenhouses are superbly adaptable to the needs of the large as well as the small estate . . . Your letterhead will bring full information. Suggestions and sketches await your request.



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CHOSEN FOR UNCLE SAM



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Washington, D. C.
York & Sawyer, Architects
New York, N. Y.
(Illustration shows Fourteenth St. Elevation)

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Semi-Recess Type

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Halsey Taylor fountains are distinguished by practical, automatic stream control and two-stream projector. Water is always at uniform height regardless of pressure variation and the drinking mound is such that it is impractical for lips to touch source of supply.

HALSEY TAYLOR
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We will be pleased to send a copy of our catalogue, as published in "Sweet's," for your files. Just write *"Bulletin 4-B, please,"* on your letterhead or business card, no obligation incurred, and your copy will be sent without delay.

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Films of paint are stripped from amalgamated tin and stretched. The force required to tear the test specimen is a measure of the tensile strength of the film and its resistance to stretching. This instrument serves in establishing standards for a new product and in constantly checking production.

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VARNISHES . . ENAMELS . . PAINTS . . DUCO

COVERT

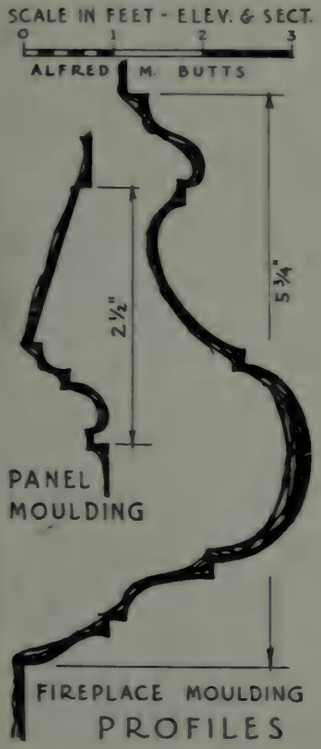
Fireplace Construction



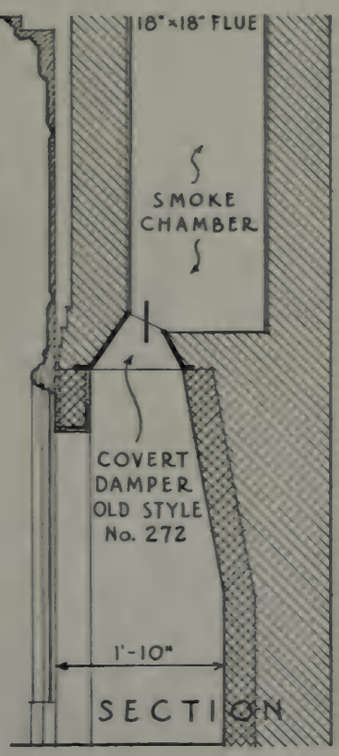
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PRETTY BROOK FARM
PRINCETON, N. J.

ARTHUR C. HOLDEN & ASSOCIATES
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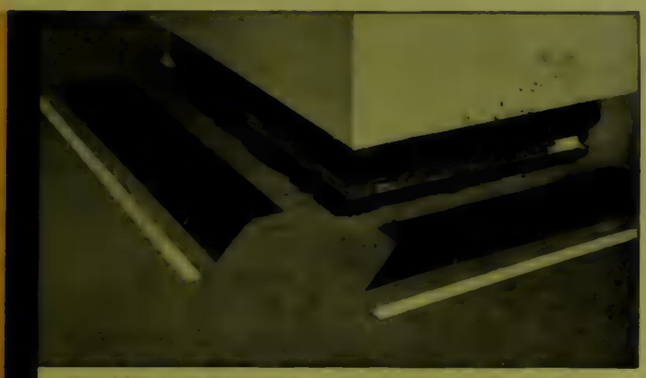
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FRAMEWORK OF BETHLEHEM WIDE-FLANGE STRUCTURAL SHAPES

BETHLEHEM

THINGS every linoleum contractor doesn't know



Materials assembled for laying one-piece cove-base and border in an "outside" corner. The cove-stick has been installed and Sealex Linoleum Paste has been applied on the wall.



Here we see the mechanic fixing the cove-base and border in place by means of headless brads, placed on 3" centers, 1/4" below top of base.



Picture shows mechanic completing the job, spreading linoleum paste under edge of the border and the patterned linoleum used for the floor.



The diagram above shows the materials required for a one-piece cove-base and border, and the mechanical details of assembly. The cove-stick is merely a piece of soft wood, triangular in shape, with 1½" legs rabbetted to a concave face. This method of construction gives a neat, sanitary effect at comparatively low cost. It was developed entirely within the Bonded Floors organization and is available through Authorized Contractors of Bonded Floors.

THE pictures on this page show three steps in the installation of a *one-piece border and sanitary cove-base* in Sealex Linoleum. Constructing this as one unit is one of those fine points of craftsmanship that mark the difference between a good floor and a fine floor.

This one-piece border and cove-base was developed by the engineers of the Bonded Floors organization. The men best qualified to install it are the Authorized Contractors of Bonded Floors, located in principal cities throughout the country.

Everyone admits that the customary factory-made cove-base furnishes a satisfactory job. The one-piece base, border and cove, however, possesses certain definite points of superiority. It lends itself to a much greater variety of decorative effects. It makes possible a border of any width, in any weight of material and in any color—as opposed to the strictly limited assortment of effects in the factory-made cove.

Furthermore, this Bonded Floors cove-and-border is structurally sounder than the old-style type. The number of cove cross-joints is reduced. It is less expensive to construct—and can readily be installed

(See next page)

on the job by a skilled mechanic. We recommend it for commercial and business installations and particularly for schools and hospitals. Not to mention kitchens in private homes.

We have described this Bonded Floors improvement in some detail because we consider it a typical example of the progressive flooring service offered by Authorized Contractors of Bonded Floors. The ready-cut borders illustrated on the right are another service feature available through Bonded Floors contractors. These strips can be combined into a great variety of attractive border effects—without the expense and wastage of material that is inevitable when the border is cut out by hand on the job.

Still another field in which our Authorized Contractors have a distinct edge on their competitors is in designing and laying custom-made floors. Our designers have had conspicuous success in creating floors for all types of buildings. The most conservative period design and the most radical modernistic effect can be carried out with equal ease in Bonded Floors.

May we send you the names of Authorized Contractors near you?

CONGOLEUM-NAIRN INC. . . . *General Office:* KEARNY, N. J.

BONDED FLOORS

SEALEX LINOLEUM

Bonded Floors are floors of Sealex Linoleum and Sealex Treadlite Tile, backed by a Guaranty Bond issued by the U. S. Fidelity and Guaranty Company. Authorized Contractors of Bonded Floors are located in principal cities.





The decorative possibilities of linoleum floors may be greatly enhanced by the use of either ready-cut or custom-cut borders. Directly above, for example, is our "Leonardo" pattern (No. 3225) used with a ready-cut border assembly of black marbleized, blue and plain black strips. Other border strips and border assembly suggestions may also be seen above.

(See preceding page)



Pennsylvania Railroad Company
Freight Station and Warehouse Building
Philadelphia

Architects and General Contractors
UNITED ENGINEERS & CONSTRUCTORS

Westinghouse Elevators . . . Large savings are afforded through the higher efficiency of Westinghouse Elevators, especially so, in such commercial structures as the Pennsylvania Railroad Company Freight Station and Warehouse Building.

"Westinghouse Elevators are the logical highways of modern architecture"

Westinghouse Electric Elevator Company

ELEVATORS

When Your Design Says
"ALUMINUM"
have it executed by ART METAL

DOES it call for bronze . . . massive, imposing, delicately etched—or enameled? Or for hollow metal . . . steel doors, trim, wainscoting, partition? Or is it to be developed in aluminum? Whatever medium your design may suggest, Art Metal craftsmen can give it faithful concrete expression.

Art Metal aluminum is sailing the seas . . . in rigid furniture on the smartly equipped new U. S. scout cruisers. It's guarding a bank . . . in impressive, amazingly light and smooth-swinging double doors at the entrance to the Union Trust in Little Rock.

It's stepping out in society . . . in the new Cleveland National Town and Country Club, so luxuriously conceived by Geo. B. Post & Sons and executed by Thompson-Starrett. The grilles, ornaments, pilasters, cornices, elevator enclosures, and deft-gliding revolving doors, are all Art Metal aluminum. Art Metal workshops fabricated the handsome vestibule doors in the New Kensington Research Laboratories of the Aluminum Company of America.

Aluminum is light-weight . . . easy to handle on the job. It does not corrode . . . needs no protection from smoke and atmospheric gases . . . shines up readily. Takes lacquer, paint, or metal plating if desired. And it can be cast, rolled, drawn, stamped, pressed, forged, extruded, spun, machined, or welded.

If you have never specified aluminum . . . if you have a job you think it would do but are not quite sure . . . write to the Art Metal Construction Company, Jamestown, N.Y. We'll be glad to tell you more about its structural and decorative possibilities.



Art Metal doors with decorative, hand-hammered panel supplied for and in cooperation with the Research Laboratories, Aluminum Company of America, New Kensington, Pa.

Art Metal

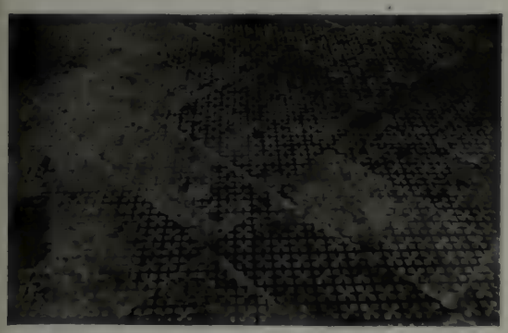
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BRONZE, STEEL AND ALUMINUM
INTERIOR EQUIPMENT FOR BANKS,
LIBRARIES AND PUBLIC BUILDINGS
. . . HOLLOW METAL DOORS AND TRIM



Right—3,350 sq. ft. No. 20 Snead Armor Grid—Contractor, Chas. R. Hedden Co., Newark, N. J.—installed in March 1929 for Merchants Refrigeration Co. at Jersey City, N. J. . . . after testing many floor materials, No. 20 Snead Grids were selected as most economical per foot, per year, by the owner of this R. R. platform, one of the largest refrigeration companies in the country. All of this company's plants now have Snead Grid protection.

In wide use for 18 years yet no Snead Armor-Grid installation has ever been renewed!



Above and Below—Snead Armor Grid installation in New York World Building—West Side Plant—Glenn S. Williamson, Eng., Turner Construction Co.—Contractor. 2,054 sq. ft. No. 20 Snead Armor Grid.



STILL more than that, no installation of Snead Grids has ever required any maintenance work. These are two facts indicating that heavy traffic floor areas may be armored with Snead Grids and show a very handsome saving over a short period of time.

Snead Grids are made of an exceptionally fine grade of grey iron and are acid resistant. The symmetrical pattern besides being attractive in appearance, affords perfect protection and traction against crosswise as well as longitudinal traffic. The effective armor at the surface of each Snead Grid amounts to 41% of its total area, this high ratio accounting for its great durability. As the Grids are almost entirely embedded in the flooring, traffic sounds are deadened. The rib sides are rough and bond perfectly with the floor material, eliminating the necessity for expansion bolts or other expensive anchoring devices. Two more important economies—there is no costly assembling operation to perform, each grid comes complete and is easily installed—and Snead Grids displace approximately 21% of finish floor grout by volume, an important saving when figured over a large area.

Here, then, is a thoroughly efficient floor armor for surfaces subject to severe traffic and wear—an armor proved over many years as indestructible and yet one that makes possible real economies in installation and use.

Three sizes of grids are manufactured and answer practically all requirements. These are No. 10 for lighter traffic—No. 20 for heavy traffic and No. 30 where the traffic is extremely severe. See Sweet's or write us direct.

SNEAD & COMPANY — Founded 1849

SELF-ANCHORING ARMOR GRIDS FOR CONCRETE AND ASPHALT FLOORS

92 Pine St., Jersey City, New Jersey



Windows that Decorate As well as Soften Light

BUSINESS, to be successful, must be efficient. Efficiency depends largely upon the clarity and smoothness with which the various individuals in the business think and work. Executives today realize that working conditions and surroundings have much to do with mental activity and, in order to achieve greater business efficiency, are giving close attention to such details as office beauty and light.

The gloom or glare of outside light, when filtered through the translucent beauty of colored glass, becomes friendly, happy, subdued and soothing. We, therefore, find in business structures stained glass and opalescent glass in skylights, windows, transoms and wherever raw light and uninspiring outlooks can be transformed into color and rich beauty.

As an architect, you will be interested in this trend. We will, on request, supply you with the names of nearby artists-craftsmen who will gladly assist you in working out designs and structural details for art glass lighting in the business structures or institutions which you now are planning.

Above is a suggested skylight in a modern office, using opalescent glass to subdue the glare.

Kokomo Opalescent Glass Co.

1300 S. Market St. ▪ ▪ ▪ Kokomo, Indiana

Whether the day be dull or bright, the light in this office is warm and cheery yet softly subdued and rich. . . .

MANUFACTURERS COLORED OPALESCENT CATHEDRAL GLASS ▪ ▪ ROLLED ANTIQUE GLASS ▪ ▪ MOSAIC GLASS ▪ ▪ GLASS FOR ART PURPOSES



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1 1500 Lake Shore Drive Apts., Chicago, Ill.
Architects—McNally & Quinn, Chicago, and Rosario Candella, Associate Architect, New York.
General Contractors—Turner Construction Company, Chicago
Mechanical Engineers—H. A. Durr & Company, Chicago

2 Chicago Evening Post Bldg., Chicago, Ill.
Architects—Holabird & Root, Chicago
General Contractors—McLennan Construction Co., Chicago

3 Medinah Athletic Club, Chicago, Ill.
Architect—Walter W. Ahlschlager, Chicago
General Contractors—Paschen Bros., Chicago

4 Trustees System Building, Chicago, Ill.
Architects—Thielbar & Fugard, Chicago
General Contractors—McLennan Construction Co., Chicago

5 Mather Tower Bldg., Chicago, Ill.
Architect—Hubert Hugh Riddle, Chicago
General Contractors—R. F. Wilson & Company, Chicago

6 Board of Trade Building, Chicago, Ill.
Architects—Holabird & Root, Chicago
General Contractors—Hegeman-Harris Co., Inc., Chicago

7 10 West Elm Street Apts., Chicago, Ill.
Architects—B. Leo Steif & Company, Chicago
General Contractors—Adolph Lindstrom Company, Chicago

8 La Salle-Wacker Bldg., Chicago
Architects—Holabird & Root and A. N. Rebori, of Rebori, Wentworth, Dewey & McCormick, Chicago
General Contractors—Hegeman-Harris Co., Inc., Chicago

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A-9

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Harry M. Haskell, Archt.

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These views are of the Hawthorne School, Beverly Hills, California, of monolithic construction throughout, with decorative details cast in place. R. C. Flewelling, Architect.

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The Cowles House, Farmington, Conn., built of White Pine in 1795 and standing today

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TIW-68



Woodbury County Court House, Sioux City, Iowa. William Steele, Architect

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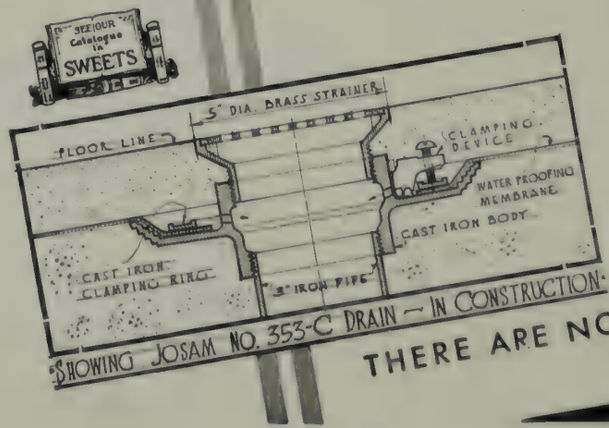
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not on your life!



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A JENNINGS *is located on the floor, outside and away from the pit*

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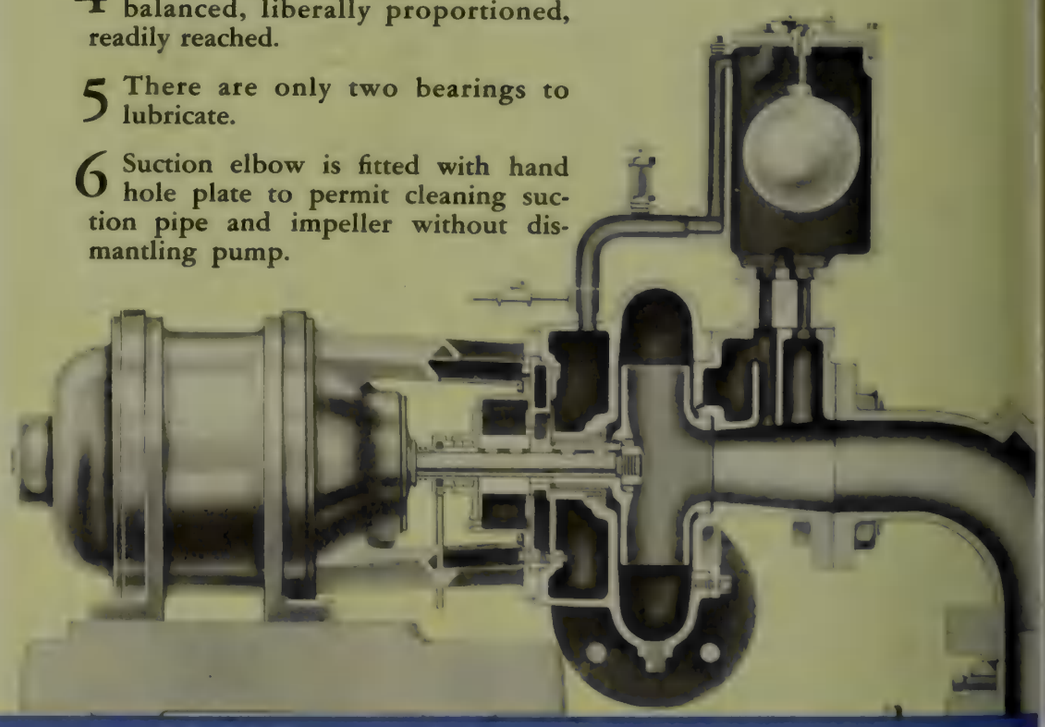
6 Suction elbow is fitted with hand hole plate to permit cleaning suction pipe and impeller without dismantling pump.

7 Priming unit is a simple, stur Hytor.

8 Iron catch basin has gas tigh

9 Controlling float switch is to closed and oil immersed.

10 Ball float has adjustable stop



Jennings SUCTION SEWAGE *Pumps*

NASH ENGINEERING COMPANY SOUTH NORWALK, CONN., U. S. A.



Immense Continuation School, Milwaukee, Wis., and a section of the Bloxonend Floor in one of its two great gymnasiums. Van Ryn & De Gelleke, Architects.

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Alcoa Aluminum Window Sills

were used in the Central Union Bank, Evansville, Indiana

-Alcoa Aluminum Spandrels, of course



Central Union Bank, Evansville, Indiana. Architects, McGuire and Shook. Associates, Walker and Weeks. Contractors, International Steel and Iron Co.

In designing the Central Union Bank, the architects, Messrs. McGuire and Shook, were mindful of the example set by the largest metropolitan buildings. They specified window sills of Alcoa Aluminum. These sills are of extruded aluminum. 112 of them, each 4 ft. 6 in. long, have a total weight of approximately 819½ lbs. They also used Alcoa Aluminum spandrels—a practice that is rapidly becoming standard with most architects.

By using these Alcoa Aluminum sills and 112 Alcoa Aluminum spandrels 4 ft. 8 in. x 4 ft. 4 in., weighing approximately 10,784 lbs.—the architects lifted about 25,000 lbs. of surplus dead-weight from the face of this bank building. And they saved money.

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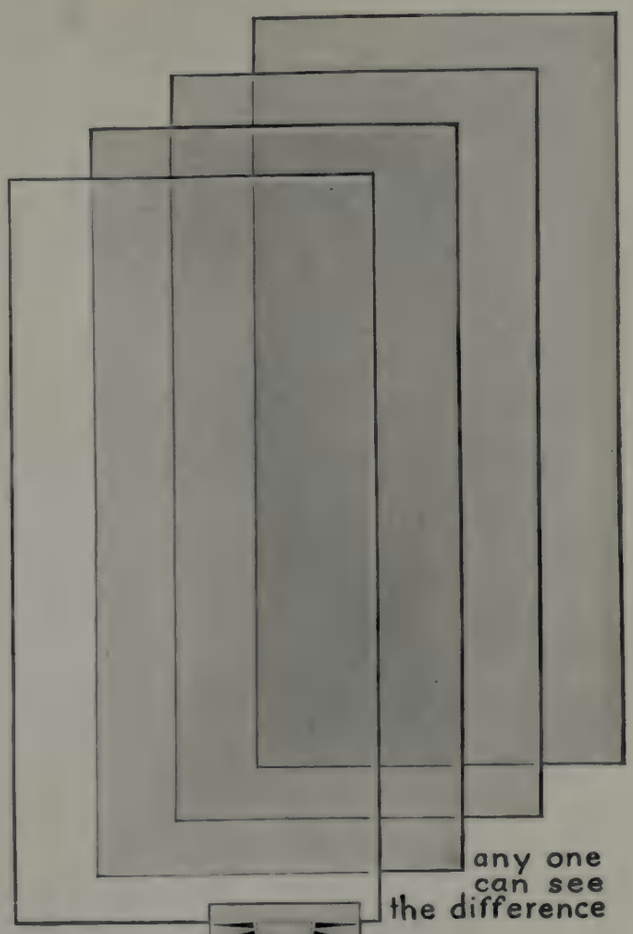
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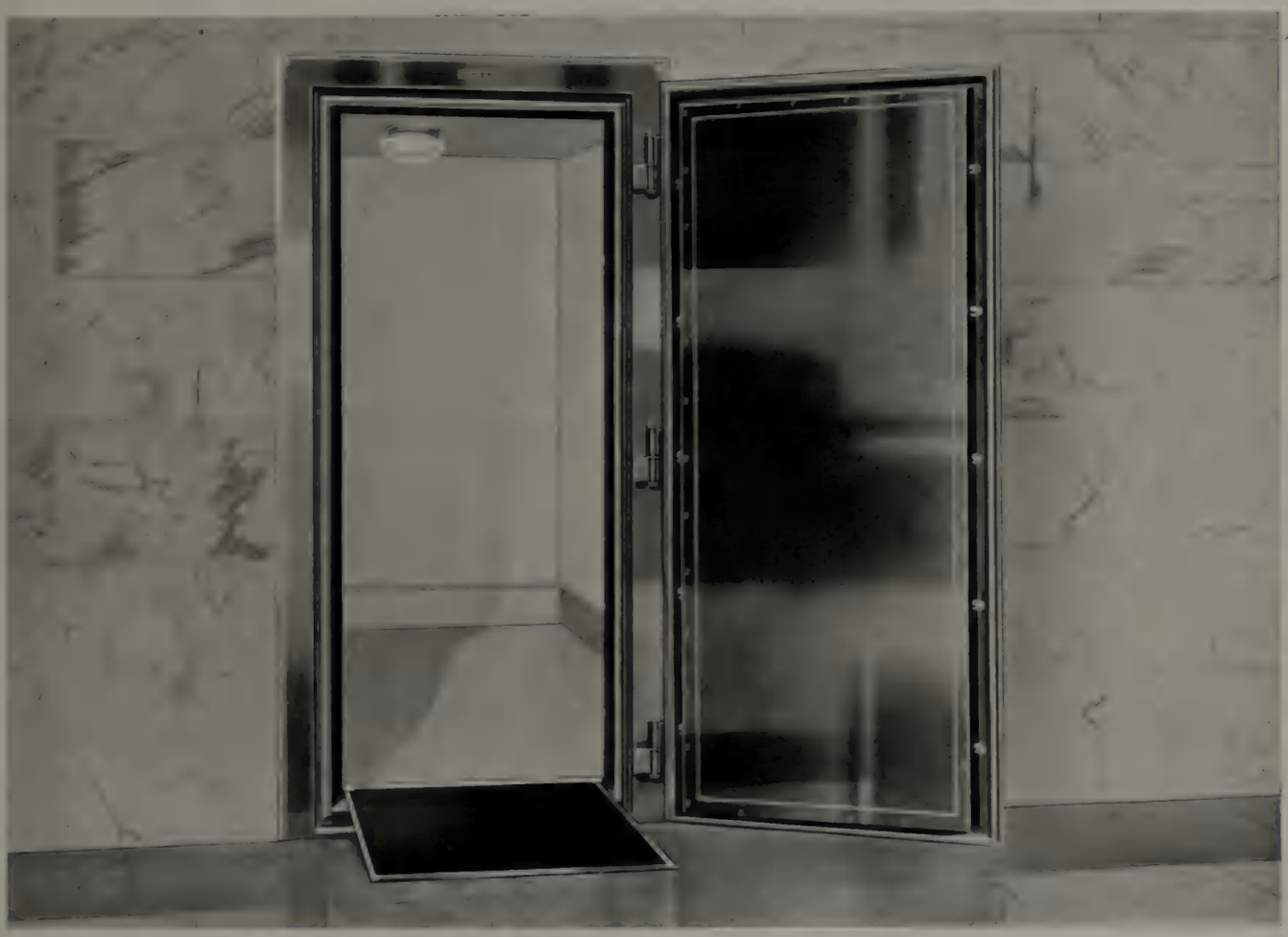
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You've been lambasting the motors we're now using ever since you got acquainted with the 'Linc-Weld.' But I want to tell you that you've overlooked one superior feature our old motors have—"

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THE LINCOLN ELECTRIC COMPANY
Department No. 30-9 CLEVELAND, OHIO

M-73

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WITHOUT TOUCHING
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"Fencraft" Casements are built by craftsmen in the shops of America's oldest and largest steel window manufacturer, with local offices in 217 cities. Ask for new catalog which gives complete "Fencraft" details.

DETROIT STEEL PRODUCTS COMPANY
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Fenestra
STEEL CASEMENTS (Screened)

TRAPPED



Steel Lath would have prevented this

AWAKENED to the smell of smoke! The mad scramble to arouse the family! A dash to the bedroom door . . . driven back . . . the hall and stairs a seething mass of flames . . . a paragraph in the next day's paper tells the story.

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2 The prospect, who, because he is a good business man, and irrespective of the money involved, takes pride in getting his money's worth in everything he buys.

3 The prospect who may be of moderate means or who may be very wealthy, but who, whatever he is, has an inborn hatred of waste in any form.

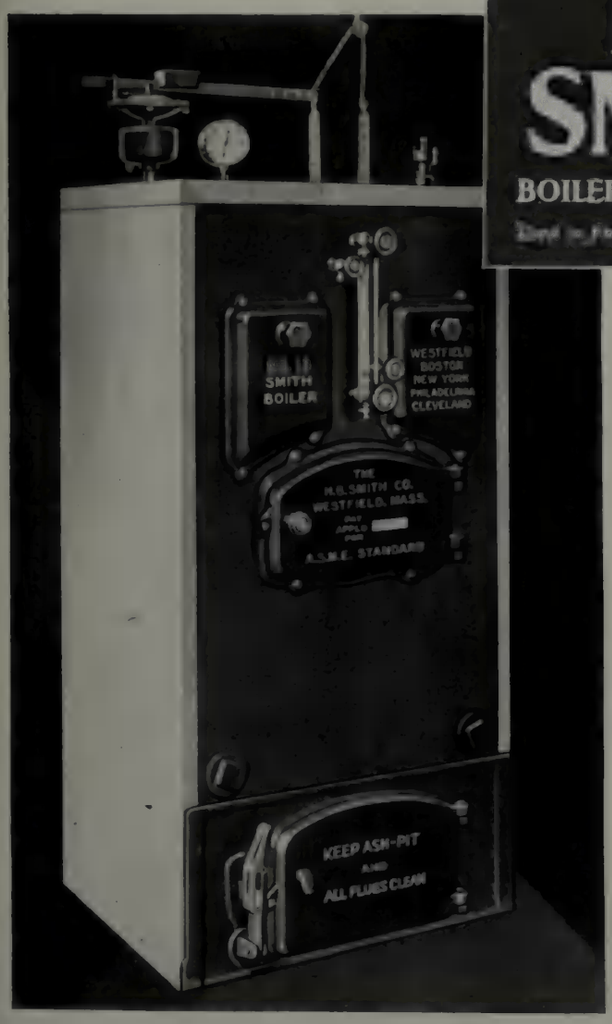
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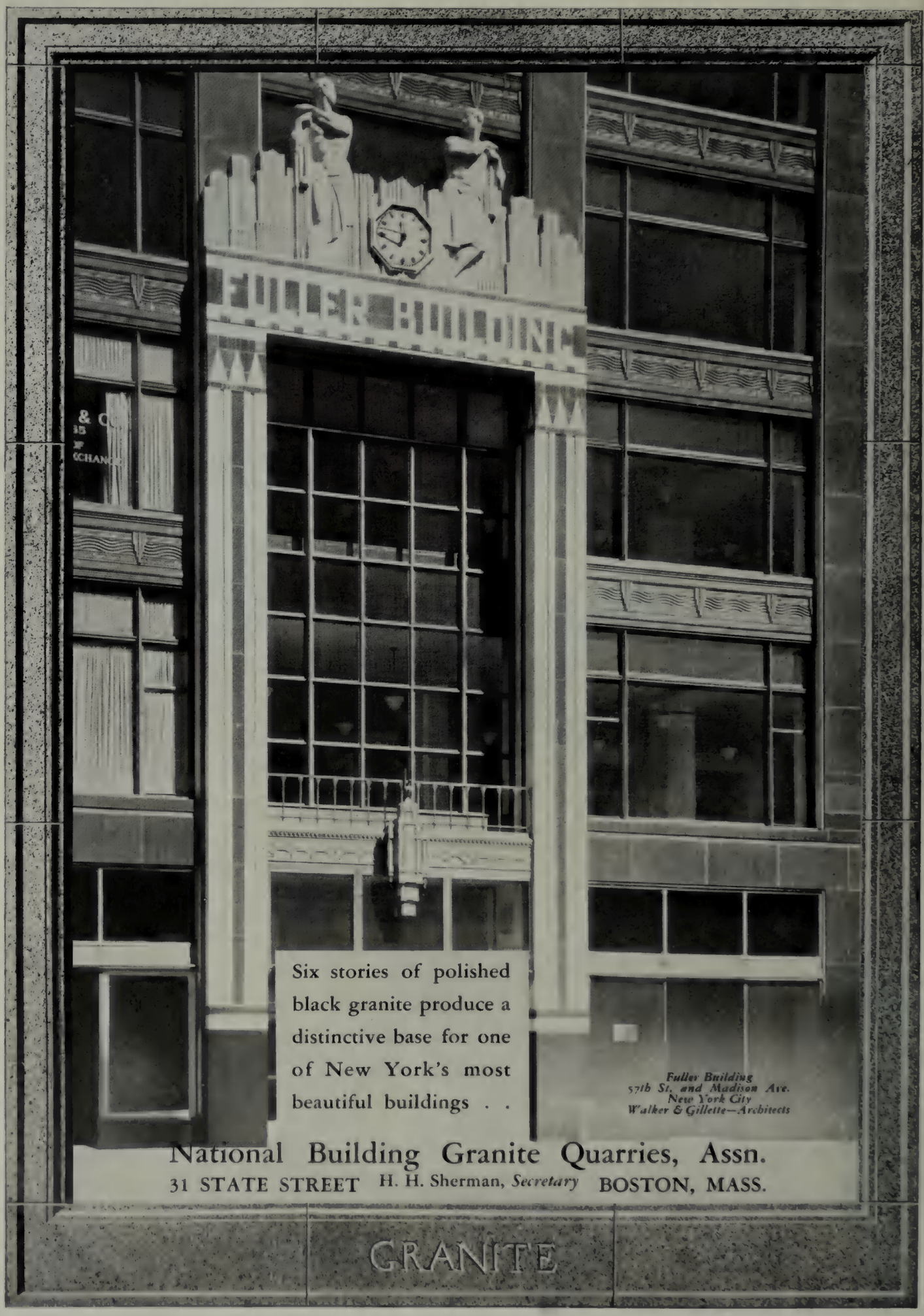
These three prospects will be forever grateful to you, their Architect, for specifying one of the New Smith "16" Boilers; or one of the larger Mills Boilers where the size of the house requires it. Grateful not only for heating economy, but also for luxurious heating comfort.

We will gladly send you at any time upon request a copy of our new book, "The New Smith 16" that you can give to prospects for their information. Address, The H. B. Smith Co., Dept. E-53, Westfield, Mass.

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31 STATE STREET H. H. Sherman, Secretary BOSTON, MASS.
GRANITE

IN THIS ISSUE

CONTRIBUTORS

Walker Evans: *a Brooklyn photographer recently returned from Europe and now engaged in commercial photography in Philadelphia and New York.*

Howard T. Fisher: *author of the Country House article which appeared in the November, 1929 issue.*

Frederick J. Kiesler: *an Austrian architect who has been practicing in New York, specializing in theatre work, and author of a recently published book on contemporary architecture.*

Robert E. Lederer: *a German architect specializing in restaurant design.*

William Stanley Parker: *contributing editor and architect practicing in Boston, well-known for his study of the legal aspect of architecture.*

Frederick P. Platt: *a New York architect specializing in planning of restaurants and athletic clubs.*

Giles Gilbert Scott: *an English architect who has designed many churches, among them the Cathedral at Liverpool.*

CALENDAR OF EVENTS
GENERAL ANNOUNCEMENTS

September	Exhibition of modern Architecture and Industrial Arts at Stockholm, Sweden.
Sept. 12-Nov. 15	"Man and Machines," an exhibit representing western industrial civilization, at Museums of the Peaceful Arts, 220 East 42nd Street, New York City.
September-October	International Hygienic Exhibition at Dresden, Germany. Buildings include a model hospital and a model housing project.
Sept. 7-14	Twelfth International Congress of Architects, Budapest, Hungary.
Sept. 8-13	A course of lectures on *Fundamentals of Architecture* for members of Illuminating Engineering Society, conducted by the School of Architecture, Columbia University, N. Y.
Oct. 1	The Committee of Twenty on Street and Outdoor Cleanliness, 2 East 103rd Street, New York City, have extended their prize contest for the design of a Litter Basket for New York City until October 1. First Prize $500.
October	The Department of Architecture of the University of New York will begin a series of lectures on "Promoting and Financing Building Projects."
Oct. 7-10	Annual convention of the Illuminating Engineering Society. Hotel John Marshall, Richmond, Va.
Oct. 8-12	Sixth National Conference of Church Architecture, Cleveland, Ohio.
Nov. 18-29	Art Exhibition, Royal Institute of British Architects, London (9, Conduit Street).
Dec. 1	Competition for "esthetic improvement" in design of water tanks, sponsored by Chicago Bridge and Iron Works. Albert M. Saxe, 430 N. Michigan Avenue, Chicago, architectural advisor.
April 18-25	Fourth Biennial Architectural and Allied Arts Exposition, Grand Central Palace, New York.

A NEW FEATURE—
ECONOMIC SURVEY OF THE BUILDING INDUSTRY IN THE RESIDENTIAL FIELD

With this issue the editors announce a new feature for THE RECORD—a series of articles giving monthly surveys of economic conditions relating to the building industry in general.

With the transitional changes in architecture there has come a corresponding change in the status of the architect himself. Apart from his artistic training he has become more and more a business man and a building specialist. The problems of specialization have made necessary a more intimate contact with business conditions. It is to satisfy and foster a demand for research data on current economic trends that this new department has been created in line with the editorial policy of furnishing the architectural profession with as much practicable information as possible. In view of the present period of depression and the decline of construction activity it is felt that such economic surveys will be very valuable to the individual architect in planning for the future.

The present study relates to the conditions within the *residential* field of construction because this field has witnessed the largest decline of activity within the past year. Subsequent articles will relate to conditions within the field of non-residential building and engineering. From time to time the price trends of materials and the prospective building outlook will be considered, together with labor conditions, in their bearing on the construction industry as a whole. This close study of changing trends will be featured with a view to providing the practicing architect with necessary information on the market for his services.

Statistics and charts will be based on figures compiled by the F. W. Dodge Corporation and will be interpreted in terms of building conditions by L. Seth Schnitman, chief statistician. Mr. Schnitman received his early training at the Sheffield Scientific School at Yale University and was formerly Chief of Division, SURVEY OF CURRENT BUSINESS, a publication devoted to current business and industrial statistics and published by the Department of Commerce at Washington since 1921.

WHAT METALS TO USE

(Continued from preceding page)

Monel, Allegheny, KA2, Ascoloy, Nirosta, 18-8, Stainless Steel, Duraluminum . . . What are these metals? What are their relative costs? What are their distinguishing qualities of color, ease of construction, permanency, and reaction to weathering? How can the architect distinguish and select among these metals for use on new building projects?

To answer these questions the research department of THE ARCHITECTURAL RECORD, in collaboration with engineers and manufacturers, has prepared a comprehensive chart giving the relative costs and characteristics of these new metallic materials. The chart appears on pages 206 and 207 of this issue.

RESTAURANTS

Restaurant planning, in the light of technical developments, has become today more highly specialized than ever before. Considerations of the class of patronage, the type of service offered and the return on the capital invested are all problems which must be considered and analyzed before the architect can even begin to present his ideas in sketches. A good architectural solution is conditioned by a complete analysis of the economic and social factors and the physical requirements of the particular establishment.

In this Technical News and Research study these problems are investigated; the results of the best practice are noted and the proper procedure indicated for the individual architect who is too busy with his practice to make an exhaustive research by himself. Equipment manufacturers and restaurant operators have been consulted in this study, and the latest trends observed. For instance, there is at present an increasing trend toward the lunch counter type of restaurant. Most existing counters are raised relatively high from the floor for ease in service but this necessitates a high counter stool. It has been found that women patrons, in particular, are averse to such an arrangement; the latest trend, it is pointed out, is to keep the counter at normal table level height, countersinking the floor behind the counter so that there may be no loss of service efficiency, and permitting the use of chairs instead of stools which thus appeals to the women patrons. Other similar developments in restaurant practice are also recorded.

Appended to the Technical News article is a check list of requirements which has been developed by the office of F. P. Platt and Brother, architects, and found from experience to be a satisfactory procedure.



THE OCTOBER ISSUE:

GLASS... a Technical News and Research study of the varied characteristics and physical properties of glass and how it may be used to best advantage in various types of construction.

HOW THE ARCHITECT MAY CULTIVATE BUSINESS... although architects do not openly solicit jobs, believing that meritorious work will induce new clients to accept their service, nevertheless there are methods of developing new business, systematically followed by successful offices, which may aid architects in increasing their practice.

PORTFOLIO OF BANKS... examples selected for their suitability to the chain bank, having similarity of treatment but with differences in plan.

DAYTON

Cog-Belts outlast any other V-belt ever built

In addition to exhaustive endurance tests under varied conditions of operation, production managers and factory superintendents are voluntarily reporting that Daytons outlast other V-Belts as much as three to one.

There are many reasons for the long life of Dayton Cog-Belts.

Dayton Cog-Belts are not moulded—they are laminated and are the only V-Belts that are die-cut in their finished state.

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The outer section consists of a series of layers of bias cut fabric—it is fully flexible to accommodate the curve of the pulley without internal strain.

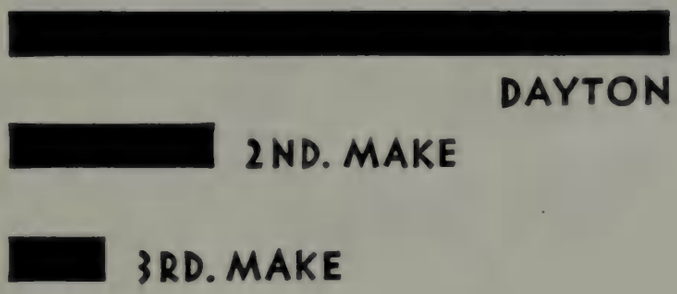
But get all the facts—complete information—about these long life, efficient V-Belts. Send for the Dayton Cog-Belt Catalog and a small section of the belt.

THE DAYTON RUBBER MANUFACTURING CO.
Dayton, Ohio

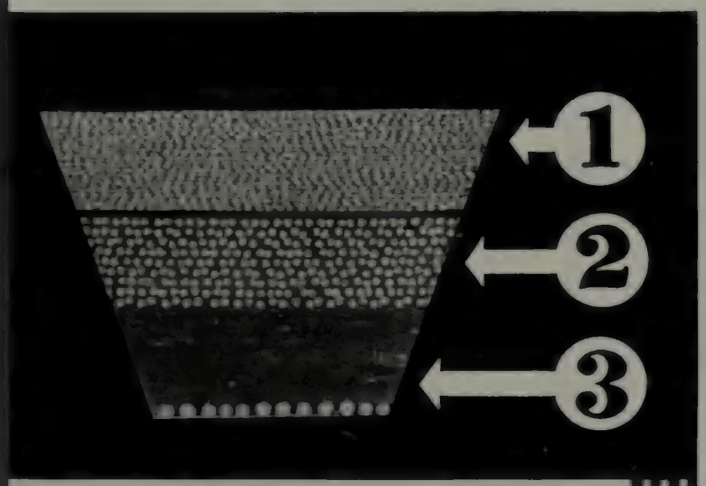
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COG-BELT DRIVES

ENDURANCE test of V-type belts

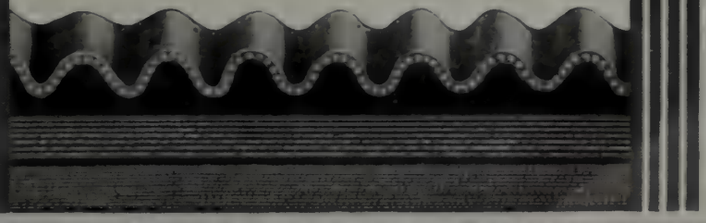


This chart shows the result of just one of the many life tests made by an independent Laboratory on a Norman V-Belt Test Machine. This machine was designed especially for the testing of V-Belts by one of the world's leading authorities on belt transmission. All tests as well as actual service operation show the same relative results.



See how Dayton Cog-Belts are built!

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2. "NEUTRAL AXIS" Section
3. COG SECTION



Complete Drives—Pulleys and Belts—in stock—all ratios 2 H. P. to 100 H. P.



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Your contractor can phone us in the morning and he'll get Gypsteel tile that afternoon or early the next day at the very latest.

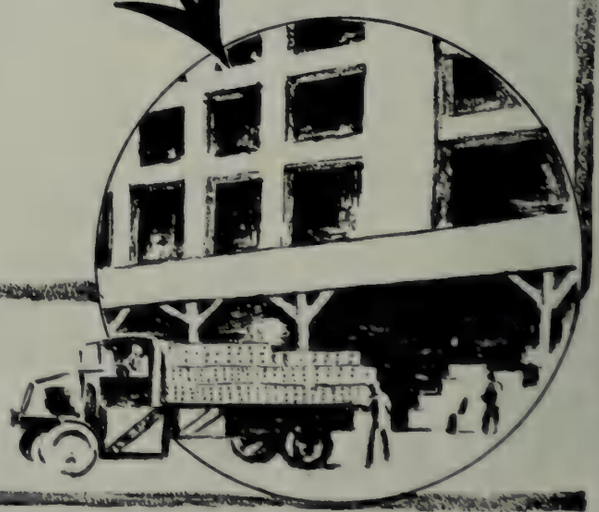
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Our rapid delivery service and the great strength of Gypsteel Partition Tile are two of the numerous reasons why we are supplying so much of the partition tile being used today in the Metropolitan New York Area.

THAT AFTERNOON



STRUCTURAL GYPSUM CORPORATION

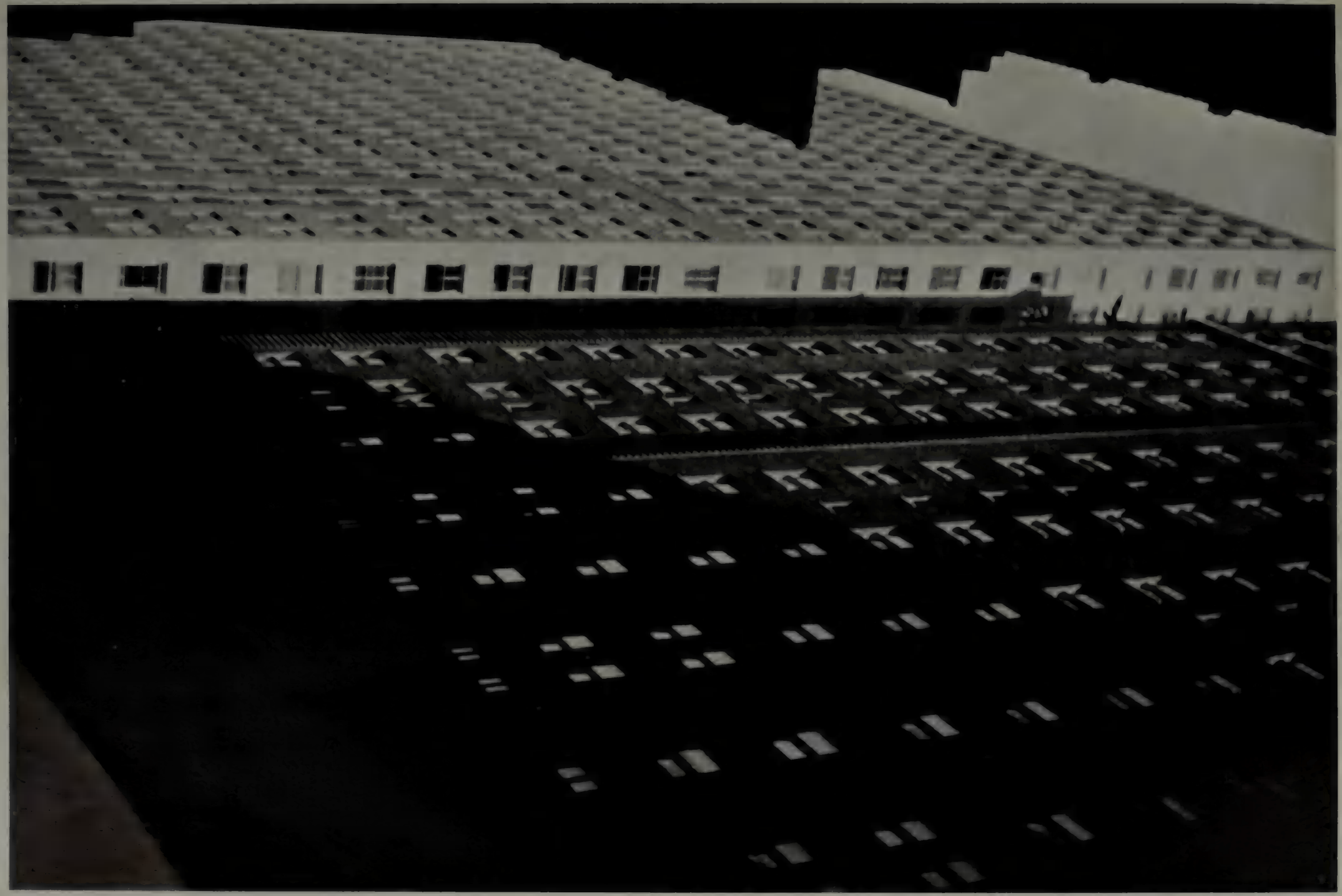
General Offices, LINDEN, N. J.

Linden 3700

PHOTOGRAPHIC STUDIES

By WALKER EVANS











THE ARCHITECTURAL RECORD

AN ILLUSTRATED MONTHLY MAGAZINE OF ARCHITECTURE & THE ALLIED ARTS & CRAFTS

VOLUME 68 SEPTEMBER • 1930 NUMBER 3

A BUSINESS OFFICE RECEPTION ROOM

DESIGNED BY HOWARD T. FISHER

This main reception room for the Frances Hooper advertising agency occupies an entire floor in the tower of the Wrigley Building. The two large double windows open up to the southeast and southwest affording an excellent view both down the Chicago River toward Lake Michigan and up the river toward the city. The general shape of the room is in the form of an "L" with equal arms. The curve in the outer corner of the room is recalled at the reentrant angle of the opposite wall.

In order to cover certain exposed pipes it was necessary to fur out the walls, thus giving a sufficient window reveal to permit the installation of Venetian blinds in pockets. The two separate double-hung windows with which each outer wall of the room is equipped are here tied together into one composition by the use of a single blind running across the entire width of the two windows. The upright column in the center is treated with a fluted panel to reduce its conspicuousness to a minimum.

The radiator under each window is concealed in a wooden enclosure also running across the full width of the two windows. The top of this enclosure is used for plants.

In the outer corner of the room is a built-in curved bookcase. Because the building is somewhat out of square, this bookcase, as well as the seat in front of it, is elliptical rather than circular in form. The upright divisions in the bookcase are wedge-shaped, being thicker at the back than at the front. This results in the sides of each compartment being parallel and thus removing the usual disadvantages of curved bookcases.

The ceiling and walls—without superfluous cornices or moldings—are entirely covered with a polished aluminum foil applied in pieces approximately one foot square. The room as far as possible was laid out so that the joints in the aluminum foil line up with the squares of the bookcases and with the window openings. The aluminum foil is .00065" thick, polished, and mounted with an asphaltic binder on



OFFICE LAYOUT

WRIGLEY BUILDING, CHICAGO

30-pound bond paper. It is applied to the wall with ordinary paper-hangers' paste. The floor, also divided into approximate one-foot squares in the same manner as the ceiling, is made of *Nu-wood*, a wood-fibre insulating board ½" thick laid in the same manner as cork tile. Alternating squares were laid with the opposite side of the material turned up so as to give a slight checkerboard pattern. This material was painted black after its installation and treated with three coats of a cork lacquer. Such a floor will not stand severe usage.

Owing to the small size of the elevator giving access to this office, the large pieces of furniture had to be built in sections. The flat desk, for example, comes apart in three pieces, and the magazine rack and smaller desk come apart in two pieces, the line of division being frankly indicated. The tops of the radiator enclosures are also removable in case of repairs. A slight set-back at the base of all the larger pieces of furniture is also employed in the baseboard around the radiator enclosures.

The room is illuminated by two ceiling lights, each consisting of eight tubular 25-watt frosted counter light bulbs. To diffuse the light a piece of sand-blasted glass is suspended below them approximately 3" from the ceiling.

The flat top desk is equipped on each side with filing drawers at the bottom and smaller drawers above. In the middle is a large drawer of a size sufficient to take an unfolded newspaper.



Stone-Raymor

A BUSINESS OFFICE RECEPTION ROOM
WRIGLEY BUILDING, CHICAGO
HOWARD T. FISHER, DESIGNER

The large desk has a built-in light which can be shoved down into a position flush with the top of the desk when not in use.



The construction of the desk light consists of a trough reflector set behind a narrow strip of sand-blasted glass.

A BUSINESS OFFICE RECEPTION ROOM
WRIGLEY BUILDING, CHICAGO
HOWARD T. FISHER, DESIGNER



Hedrich-Blessing

A BUSINESS OFFICE RECEPTION ROOM
WRIGLEY BUILDING, CHICAGO
HOWARD T. FISHER, DESIGNER

All exposed woodwork is painted a bluish green.



Hedrich-Blessing

The fabrics repeat the color scheme of the woodwork.

A BUSINESS OFFICE RECEPTION ROOM
WRIGLEY BUILDING, CHICAGO
HOWARD T. FISHER, DESIGNER

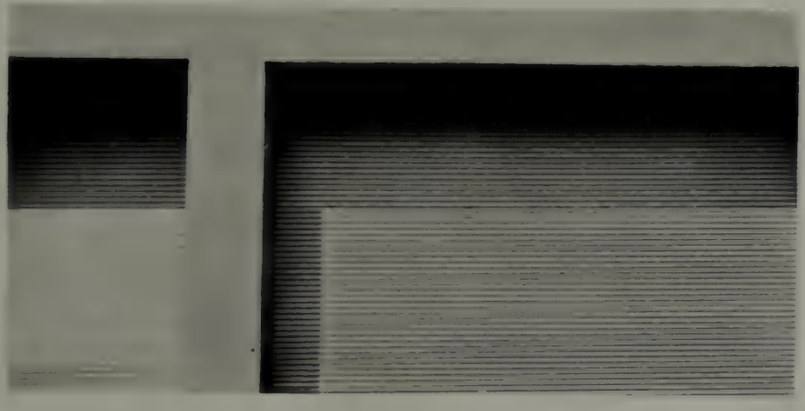


Hedrich-Blessing

A BUSINESS OFFICE RECEPTION ROOM
WRIGLEY BUILDING, CHICAGO
HOWARD T. FISHER, DESIGNER

The illumination of the small desk is by a trough reflector also set behind a piece of sand-blasted glass.





WHAT METALS TO USE

QUALITIES OF METALS FOR BUILDINGS*

MATERIAL	APPROXIMATE ESSENTIAL COMPOSITION [1]	APPROXIMATE PRICE PER LB.[4]	WEIGHT PER SQ. FT. 24 GA. (.025)	APPROXIMATE PRICE PER SQ. FT. 24 GA. (.025)	ORDINARY ATMOSPHERE	COLOR WHEN NEW	COLOR AFTER WEATHERING	SPECIAL WEATHERING CONDITIONS [5] Moist Sulphurous atmosphere
Aluminum (2s)	Al 99%	.348	.283	.087 .123	Surface film arrests further oxidation	Obtainable polished or oxidized gray finish	Loses some reflectivity with age	Recommended
Duralumin (17st)	Al 92% Cu 4% Mg 0.5% Mn 0.5%	.62	.283	.225	" "	" "	Darkens with age	Can be used if protected
Aluminum-Silicon (43s)	Al 92.5% 5.0%	.348	.283	.12	" "	" "	" "	Recommended
Brass (red)	Cu 85% Zn 15%	.19	1.1376	.216	Surface film of oxidation and intercrystalin corrosion	Polished or dull finish	Turns green	Recommended by manufacturers
Brass (yellow)	Cu 70% Zn 30%	.18	1.0908	.196	" "	" "	" "	Limited use recommended
Bronze	Cu 89% Zn 9% PB 2%	.183	1.1484	.21	Surface film prevents further corrosion	" "	" "	Recommended by manufacturers
Copper	98% Cu	.174	1.152	.20	" "	" "	" "	Recommended
Everdur	Cu 95% Si 4% Mn 1%	.30	1.1016	.33	" "	" "	" "	" "
(Stainless Steel or Iron) 1. Chronium Steel	Cr 15-18% C under 0.10%	.285	1.008	.287	" "	" "	Will discolor unless highly polished	Recommended by manufacturers
2. Chronium Nickel Steel 18&8	Cr 18% Ni 8% under 0.15%	.36	1.0224	.368	No visible surface film	" "	Remains bright if polished; highly resistant in other finishes	" "
German Silver	Cu 65% Ni 18% Zn 17%	.29	1.1376	.329	Surface film prevents further oxidation	" "	Green cast	" "
Monel Metal	Ni 68% Cu 29% balance Mn C, Si and Fe	.46	1.152	.468	" "	" "	Mottled green, brown and black	Widely used
Nickel	99% Ni plus Mn and C	.56	1.152	.568	" "	" "	" "	Used in special cases
Zinc	99% Zn	.095	.9108	.123	" "	Gray	Dull Gray	Not recommended
Zilloy	4% Al, 3% Cu Balance Zn	.102	.130	.133	" "	Gray	Battleship gray	Recommended

[2] TRADE NAMES ON STAINLESS STEEL OR IRON

Chromium Steel

Ascoloy No. 66
Carpenter No. 3, 5
Delhi A
Duraloy B
Enduro A A
Lesco M
Special Defirust
Stainless Iron 2, 18
Stainless M
Uniloy 1409, 1609
U. S. S. Chromium Steel 16-18

Allegheny Steel Company
Carpenter Steel Company
Associated Alloy Steel Company
Duraloy Company
Republic Steel Corporation
Latrobe Electric Steel Company
Rustless Iron Corporation of America
Crucible Steel Company of America
Firth-Sterling Steel Company
Universal Steel Company

U. S. Steel Corporation

Chromium Nickel Steel 18 and 8

Allegheny Metal
Carpenter No. 4
Defistain
Duraloy 18-8
Enduro Nirosta
Lesco 18-8
Midvale V2A
Nickel Steel 18-8
Nirosta KA-2
Rezistal KA-2
Stainless N
Stainless U
Sterling Nirosta
U. S. S. Chromium

Allegheny Steel Corp.
Carpenter Steel Company
Rustless Iron Corporation of America
Duraloy
Republic Steel Corporation
Latrobe Electric
Midvale Company
U. S. Steel Corporation
Associated Alloy Steel Company
Crucible Steel Co. of America
Colonial Steel Company
Colonial Steel Company
Firth-Sterling Company
U. S. Steel Corporation

Other Metals

Everdur
Monel Metal
Zilloy

The American Brass Company
International Nickel Co
New Jersey Zinc Sales Co.

QUALITIES OF METALS FOR BUILDINGS

SPECIAL WEATHERING CONDITIONS [5] Sea Water	FORMS AVAILABLE [6]	METHODS OF FABRICATION [7]	WEIGHT IN LBS. PER CU. INCH	MEAN COEFFICIENT OF THERMAL EXPANSION 32°-212° F.	MELTING POINT DEGREES F.	ULTIMATE STRENGTH IN LBS. PER SQ. IN.	YIELD POINT LBS. PER SQ. IN.	APPROXIMATE REDUCTION OF CROSS-SECTION AREA IN TENSION TEST	ELONGATION %
Recommended for special uses	All except Fr	DD, F, R, W, SP	.098	.0000133	1215	12,000 to 30,000	4,000 to 25,000		40 to 5
Can be used if protected	All Except C	DD, F, R, W	.101	.0000123	1193	50,000 to 63,000	25,000 to 40,000		25 to 16
Recommended for special uses	All except Fr and SMP	DD, F, R, W, SP	.096	.0000122	1180	17,000 to 22,000	8,000 to 16,000		25 to 3
Recommended by manufacturers	B, CR, D, S, T, W	All	.316	.0000104	1875	43,000 to 75,000	25,000 to 50,000	5 to 60%	4 to 47
Limited use recommended	B, CR, D, S, T, W	All	.303	.0000096	1800	40,000	10,000	50%	35
Recommended by manufacturers	All	SS	.319	.0000101	1920	35,000 to 60,000	12,000	5 to 40%	3 to 35
Recommended	B, CR, D, HR, S, T, W	All	32	.0000088	1980	35,000 to 55,000	24,000 to 44,000	60 to 70%	5 to 35
.. ..	All	All	.306	.00000944	1830	50,000 to 145,000	20,000 to 95,000	30 to 80%	5 to 50
Recommended by manufacturers	All	DD, F, R, SS, W	.280	.0000061	2700	80,000 to 150,000	45,000 to 110,000	40 to 60%	15 to 30
.. ..	All	DD, F, R, W, SS, SP	.284	.0000090	2550	80,000 to 120,000	40,000 to 60,000	55 to 70%	45 to 60
.. ..	B, CR, D, S, W	All	.316	.0000102	2030	55,000 to 100,000			2 to 50
.. ..	B, CR, D, HR, S, T, W	All	.320	.000014	2460	65,000 to 140,000	35,000 to 125,000	30 to 75%	Up to 50
.. ..	All	All	.320	.000014	2640	65,000 to 115,000	20,000 to 100,000	30 to 75%	Up to 53
Not recommended	C, S	F, R, SS	.253	.000014	786	30,000 to 40,000			15 to 35
Not recommended	C, S	F, R, SS	.256	.000033	787	45,000 to about 65,000			

[1] Al Aluminum
C Carbon
Cr Chromium
Cu Copper
Fe Iron
Mg Magnesium
Mn Manganese
Ni Nickel
Pb Lead
Si Silicon
Sn Tin
Zn Zinc

[4] *Prices:* The prices quoted are approximately correct at this time, with variations, depending on size of job, location, market conditions, and quantity.

[5] *Caution:* Danger of Electrolytic Action. The reaction of wrong combinations of metals is well illustrated by the common galvanic cell, using copper and zinc electrodes. Metals of opposite electrical poles will react in a similar way. Possibility of formation of galvanic couples necessitates special study in order to avoid trouble, especially where there is any problem of moisture.

[6] *Key to Abbreviations*
Available forms:—
B — Bar
C — Castings
CR — Cold-rolled
D — Drawn
Fr — Forgings
HR — Hot-rolled
S — Sheets
T — Tubing
W — Wire
ES — Extruded shapes
SMP— Screw machine products

[7] *Fabrication Methods:*
DD — Deep drawing
F — Flanging
R — Riveting
SS — Soft soldering
W — Welding
SP — Spinning

*Much of the data used is from the table which appeared in the September, 1929, issue of the Chemical-Metallurgical Engineering Journal.

Aluminum and Duralumin. Originally "duralumin" referred to the alloy invented by Alfred Wilm, but it is now more or less generally used for all of the strong aluminum alloys. These alloys include 17ST, 51ST, and 25ST. They are all wrought alloys, like the original duralumin. Most aluminum ornamental work is done in the aluminum silicon alloy No. 43.

The natural finish of aluminum is that of silver with a bluish cast. However, there is a slight difference in the color of the different products, depending upon the method by which they are made. On polishing an aluminum surface, the tinge of blue becomes more pronounced, and the surface has a greater reflectivity for light. Sand-blasting reduces the reflectivity of the surface, and produces a finish similar to that of etched glass. A carborundum blast gives a darker shade of gray, since in this operation small particles of acarborundum are deposited on the aluminum. A satin finish is obtained by wire-brushing the surface or rubbing it with an emery cloth. A polished surface will remain brighter much longer than a rough or "as cast" surface, since the dust and dirt in the air cannot collect on it as easily.

Artificial shades of gray may be produced by deplating products made from the aluminum-silicon alloys. In this deplating by electrolysis, aluminum is removed from the surface and silicon particles are left exposed. Since oxygen forms at the anode, the surface of the piece being deplated is oxidized. By varying the current densities and time, different shades of gray may be obtained.

Bronze and Red Brass. These alloys, which are of compositions widely available according to properties desired, have long been used, and their applications are well known, consisting principally of ornamental trim.

Copper. When copper is first erected, it is a distinctive reddish color. This darkens until the metal becomes a grayish black. After a period of time, it changes to a gray-green which is characteristic of the weathered metal.

This slight surface corrosion is governed by atmospheric conditions. Near the seacoast this change comes about within a year or two. In manufacturing centers the copper frequently remains black for a number of years before the change to gray-green patina is complete. This is due to small amounts of sulphur gases in industrial atmosphere. Away from salt air and manufacturing centers, this change is very slow. In these regions it is often desirable to color copper artificially.

Everdur. This is a relatively new copper-bearing alloy, originated and now being developed by the American Brass Company. It has excellent corrosion-resisting properties. Its composition is approximately 95% copper, 4% silicon, and 1% manganese. In weathering it takes on the gray-green patina of copper on bronze.

Nickel Silver Alloy (German Silver). This is a white metal available in several analyses, one of which is 65% copper, 18% nickel, 17% zinc. It is an attractive looking metal but requires much attention to keep it so.

Nickel. This metal requires frequent polishing to keep it bright. Applied as solid metal, it is probably more permanent than copper.

Monel Metal. A white metal 68% nickel, 29% copper, and balance manganese, carbon, silicon and iron. It is excellent for interior applications of great variety, and has been successfully used on exteriors. Owing to the copper content this metal will weather to a mottled gray-green brown.

Stainless Steel, Stainless Iron or Rustless Steel.

1. *Chromium Steel.* For interior work, a stainless material known simply as stainless iron or steel has been found eminently satisfactory and has been extensively used in bank vaults. Its lower price is an important factor in its selection. When strength rather than perfect corrosion resistance is desired, a lower chrome type (11 to 14% chrome) is available.

2. *Chromium Nickel Steel* (Eighteen and Eight). For external use, the different types of this material have narrowed down to alloys, chiefly iron with high chromium content plus nickel as the preferred composition suitable to meet conditions required. The metal now generally manufactured and recommended is available under a long list of trade names (see chart). It contains 18% chromium and 8% nickel, with the balance chiefly iron, and is known to steel makers as "Eighteen-Eight." It resists ordinary corrosion, remaining bright for a long period of time. The maintenance factor is practically eliminated.

Steel: Galvanized, Schope and Other Protective Coatings. Zinc-coated (galvanized) steel sheets have become tonnage material for industrial buildings but require considerable maintenance, and unfortunately have a life of only a few years. It is felt that improved quality is possible and could be furnished if a demand were created. Steel is sometimes protected by spraying on a surface of molten zinc during the process of manufacture. (An eight-story metal-walled building in Holland by Van Der Vlugt uses this finish.)

Enameled Steel. Porcelain enamel may be applied to sheet steel or other types of sheet metal. It may be applied in all colors, and will not be affected by weathering except in a moist sulphurous atmosphere where special acid-resisting enamel should be used.

Zinc. This metal weathers to a battleship gray. It is interesting for its stability of surface and, when strength is not a factor, this property together with its low price and possibility of contrasting effects should command favorable attention. Zilloy is an alloy of 93% zinc, 4% aluminum, and 3% copper.

METAL CHAIRS





DESIGNED BY MIES VAN DER ROHE
BERLIN, 1927







DESIGN MARCEL BREUER
BAUHAUS DESSAU, 1926



WORK CHAIR
DESIGN BAUHAUS DESSAU
1929



KITCHEN STOOL
DESIGN BAUHAUS DESSAU
1929





DESIGN LE CORBUSIER, JEANNERET, PERRIAND PARIS, 1929





DESIGN LE CORBUSIER, JEANNERET, PERRIAND
PARIS, 1929





AIRPLANE CHAIRS

FORD MOTOR COMPANY



Sigurd Fischer

Window display contributes to selling of merchandise. Goods and the architectural setting are coordinated, illustrating the close tie-up between selling and display.

SHOP WINDOW DISPLAYS

SAKS AND COMPANY
NEW YORK CITY

F. J. KIESLER
DESIGNER



Sigurd Fischer

WINDOW DISPLAY
SAKS AND CO., NEW YORK CITY
F. J. KIESLER, DESIGNER



Sigurd Fischer

WINDOW DISPLAY
SAKS AND CO., NEW YORK CITY
F. J. KIESLER, DESIGNER



Sigurd Fischer

WINDOW DISPLAY
SAKS AND CO., NEW YORK CITY
F. J. KIESLER, DESIGNER



Sigurd Fischer

WINDOW DISPLAY
SAKS AND CO., NEW YORK CITY
F. J. KIESLER, DESIGNER

INTERIOR DISPLAYS
SAKS AND COMPANY
NEW YORK CITY

WALTER F. MARCH
DESIGNER





Peter C. Pettis



South Side and West Front

THE NEW CHARTERHOUSE CHAPEL

SURREY, ENGLAND

GILES GILBERT SCOTT, ARCHITECT

The new chapel of the Charterhouse School, at Godalming in Surrey, is a memorial to Carthusians who fell in the War.

The total interior length of the chapel is 190′, the width 43′, and the height from the floor to the crowns of the transverse arches 62′. The five great lancet windows on each side, whose tops are carried up into the vaulting, are 38′ high and 3′ 3″ wide.

The exterior walls are faced with Bargate stone of a light tawny cream. The roof is covered with handmade sand-faced tiles of a warm grayish hue. Inside the walls and vaulted roof are plastered and also tinted a warm cream.

The altar and the reredos are made of the brown Hornton stone which comes from the neighborhood of Banbury. The organs, galleried out from opposite sides of the chapel, occupy one bay near the east end. At the west end, a stone screen, which extends as high as the tops of the stall canopies, forms a shallow ante-chapel which is in reality only a passageway. The outer side of this screen is inscribed with the names and years of all the old Carthusians in whose memory the chapel is built. The inner side is lined with canopied stalls. All the woodwork in the chapel is of oak, devoid of dressing.

The head master of Charterhouse calls attention to certain considerations: "A school chapel differs both in use and origin from an ordinary church, and its architecture is conditioned by the difference. It has a uniform congregation. . . . A parish

church has a larger constituency than a school chapel, but in actual experience it never gathers them all together. A school chapel will be filled daily; a school of six hundred boys needs a larger building than a town with a population of thousands."

The proportion of wall surface is vastly in excess of the window area. The tall lancet windows are set well back from the interior wall surface so that on looking up the chapel from the west end no windows are visible, except the east window which carries the eye at once to the altar and reredos.

The fenestration gives complete adequacy of lighting within a relatively small glass area. Small subsidiary windows penetrate the walls at the sides of the chapel just above the stalls. The lancet window tops extending well up into the vaulting necessitate a dormer treatment.

Five great buttresses, or pairs of buttresses, divide each side into six bays. These rib-like coupled buttresses that articulate the exterior are patently fresh creations. The architect has drawn upon the storehouse of precedent only to call into being something wholly fresh. He has used precedent as a servant.

HAROLD DONALDSON EBERLEIN



NEW CHARTERHOUSE CHAPEL
GODALMING, SURREY
GILES GILBERT SCOTT, ARCHITECT

West Screen



West End

NEW CHARTERHOUSE CHAPEL
GODALMING, SURREY
GILES GILBERT SCOTT, ARCHITECT



NEW CHARTERHOUSE CHAPEL
GODALMING, SURREY
GILES GILBERT SCOTT, ARCHITECT

Southeast Porch



West Door

NEW CHARTERHOUSE CHAPEL
GODALMING, SURREY
GILES GILBERT SCOTT, ARCHITECT

WORKING SCHEDULE FOR DRAFTSMEN

How long should be the working week or the working day? What about summer schedules? Does the architect-employer also gain by "Saturdays off"?

"Saturdays off" for draftsmen during summer months is commonly accepted by architectural firms not only for convenience to the office force but because there is "better morale with no loss in performance." In a survey that was limited to investigation of fifty offices in scattered parts of the country, information was obtained on:

1. Hours of employment during summer and remainder of year;
2. Whether or not office work was done on Saturday;
3. Advantage or disadvantage of system.

Ninety-six per cent of offices reporting do not work during summer more than five of the seven week days. The Saturday loss in summer is usually compensated by longer working hours. In most cases, the reduced time is applied to June, July and August, but in four instances September is included. Two offices close on Saturday throughout the year, the force working until ten o'clock p. m. on each Thursday. Total working hours during the week vary from 39 to 45 hours during winter and from 35 to 45 hours during summer.

The following are representative schedules to which comment by a member of the firm is added.

	Mon	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7¾	7¾	7¾	7¾	7¾	0	38¾
Other Seasons	7	7	7	7	7	4	39

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	8	8	8	8	8	0	40
Other Seasons	7½	7½	7½	7½	7½	4	41½

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7¾	7¾	7¾	7¾	7¾	0	38¾
Other Seasons	7	7	7	7	7	4	39

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7	7	7	7	7	0	35
Other Seasons	7	7	7	7	7	3½	38½

Comment of Firm: "We consider it an advantage to close the office on Saturday during June, July and August. The time is made up on a 'gentleman's agreement.' "

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7	7	7	7	7	0	35
Other Seasons	7	7	7	7	7	4	39

Comment:

"We all get more time off and can work better while here. The acceptance of the five-day week by the building industry, and the surprising sight of a skyscraper standing silent on Saturday, has pushed things further toward Mr. Ford's five-day week, and I think it will gradually come to most business and professions."

Comment:

"During June, July, August and September our office is closed all day Saturday except for attendance to cover special messages, etc., and the staff works a sufficient time on the other five days of the week to make up for Saturday closing. The advantage of this arrangement is that the time put in on the five week-days during the months when we are closed for Saturdays is much more efficiently used than was the case when the office was open on Saturday mornings during summer months, because during those summer months there was a much reduced attendance of those who should be at the office and a good deal of lost time due to plans to get away."

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7½	7½	7½	7½	7½	0	37½
Other Seasons	7	7	7	7	7	3	38

Comment:

"We have made a practice of closing our office on Saturday during the four summer

months for the last six years and find it has worked out most satisfactorily in every way. We find that efficiency and the amount of work accomplished are greater, rather than less."

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7	7	7	11	7	0	39
Other Seasons	7	7	7	11	7	0*	39

Comment:

*"On Thursday nights we work until 10:00 P. M. and take Saturday off the year round."

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	8	8	8	8	7	0	39
Other Seasons	7	7	7	7	7	4	39

Comment:

"All my men like this summer schedule (9 a. m. to 6 p. m. during summer) as it gives them long week-ends. None of my clients comes into the office on Saturdays and most contractors now don't work on Saturdays, so it is no inconvenience to anyone."

Comment:

"If we are not busy draftsman works until 5 and we charge his 4 hours for Saturday against him and when we are busy he makes this up in overtime. Eight hours a day for a draftsman is about his limit without his becoming overtired, and a man can work for 10 hours a day for about two weeks but he is then too tired to continue this schedule for the following week, when we work one night and close at 5 the next alternating and so on."

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Summer	7½	7½	7½	7½	7½	0	37½
Other Seasons	7½	7½	7½	7½	7½	3½	41

Comment:

"I believe the half-day Saturday in summer is useless so far as the office is concerned—the men come in late and get away as early as possible, and the intervening time is spent getting ready to go, or thinking about it. Moreover, the full day Saturday and Sunday keep the men fresher during the Summer months."

Other Comments:

"In order to live most people must work. I am not in favor of any five-day week with six days' pay at the present stage of our economic development. I always worked six or seven days a week and three or four evenings also, and I still do this. A good deal of my success—such as it is—I attribute to my willingness to work while the other fellows were wasting time playing.

"It's very easy for the men to take holidays at the Boss' expense. I notice, however, where men are on a time basis and take holidays at their own expense, they don't take them.

"Working longer hours during the week and taking Saturdays off is not satisfactory as far as the employer is concerned and I've talked to a number who have tried it. It comes down to a reduction in hours of work per week at the same pay and is at the expense of the employer 100%.

"The men start to think of their holidays now on Friday afternoon even when they work Saturday. If they shouldn't work Saturday they would try and get away Friday and begin thinking about it Thursday.

"I treat my men fairly—they get two weeks' vacation (I didn't take one for many years); they are paid when they are sick; they are paid time and one-half for overtime. Sometimes they are sick a day or two one week and the next week they work a few hours' overtime and expect to be paid for it.

"Have a heart for the Boss—someone must work besides him in order to pay rent and salaries. The trend of the time is to avoid work as much as possible—we have forgotten the example of our forefathers. Nothing worth while was ever accomplished without work and thrift instead of making a bad situation worse. The reason we have gunmen and bandits is because men want easy money and are not willing to work for it.

"To sum up—less work is accomplished by working longer hours early in the week

and taking Saturdays off than by working regular hours and also on Saturday. Saturdays off are taken at the expense of the Boss and are another added expense."

Comment:

"It has long been our custom to close the office Saturday mornings in summer time, starting the first of July and ending the first Saturday after Labor Day. However, we usually make up the time by working until 5:30 on week days. We have found that more work is accomplished by working until 5:30 than by working on Saturday, and we feel that it is more equitable to our employees to permit them to take Saturday off when many times the executives take the Saturdays off. It is a better working organization than coming in Saturdays for one-half day.

"In the winter time I feel that the demands of our clients are better met by working on Saturdays."

Comment:

"It has been our custom during the last few years to adopt the Saturday-closing plan during the months of June, July and August. It is the plan in this office to make up the time lost on Saturday morning by having the draftsmen work the requisite number of hours Tuesday night of each week. We find that this works out very much better than by increasing each day's work by an hour or so.

SUMMER VACATION

The office of Frederick L. Ackerman solved to their own satisfaction the summer vacation which often is spread over several months with consequent disorganization. "Last summer," writes Mr. Ackerman, "we inaugurated a new system for summer vacations which we thought would serve our office and our clients in a better manner. The one summer's experience was quite satisfactory and will probably be continued until something better is offered.

"We notified our clients, jobs under construction, and others interested, that the office would be closed for a period of two weeks starting on a given date. At this time all went on their vacations except one or two who were here to take care of jobs in progress. The office was officially closed, but open enough to take care of new work and contingencies. In other words, a skeleton force remained.

"This system has its advantages insofar as there is not a continual shifting of duties in the office during the summer and outsiders are not disappointed in finding certain members of the staff away. Any disappointments that come, come all at once at a definite stated time. It also simplifies the allotment of periods for vacations as no one feels that they are going away at a more advantageous time than others."



Thousands of dressing rooms at Coney Island beach cover more than two acres of ground space. (See following page for simplified dressing room planning.)

NOTES ON DRAFTING AND DESIGN

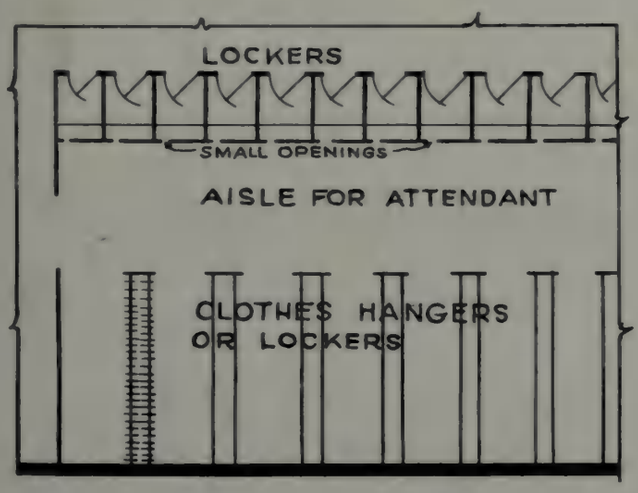
REDUCE DRESSING ROOMS

Dressing rooms may be reduced in number by an improved method recently devised for a beach bathhouse near Berlin. Instead of providing a separate dressing room for each bather, as is the case at most beaches, a limited number of rooms are built with small lockers or hangers adjoining these dressing rooms. The occupant of a dressing room passes clothes and valuables to an attendant through a small opening at the rear of the dressing room. The bather is given a number tag that slips over the wrist. The attendant places the clothes in a numbered locker or on a hanger. When the dressing room is vacated it is ready for use by another person. Clothes are watched by the attendant with responsibility for loss by the management. With this method 40 dressing rooms may do the service of 800, and there is a considerable saving in construction cost and space. Also dressing rooms may be made more convenient because of their limited area.





Courtesy of Bauwelt



FOLDING PARTITIONS AND DOORS

A novel means for closing off adjoining rooms or dividing one room into smaller units is made possible by the Fol-Dec folding partition. It is suited to hotels, schools, banquet halls, dining rooms, churches, Sunday schools, lodge halls, gymnasiums, apartments, hospitals, kitchenettes, and homes. The partitions are made of steel upright stiles, held in place by steel spacers, covered on each side with a blanket of heavy felt. The felt aids sound-proofing. The folding partitions can be opened like curtains and locked like doors, giving privacy.



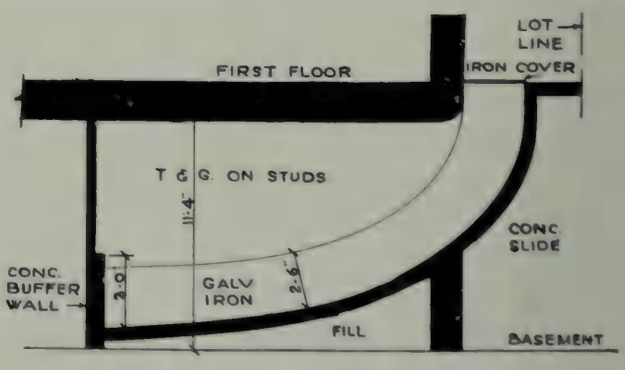
Courtesy of Folding Products Corp.

AUTOMATIC DOOR THAT OPENS TO ONE'S SHADOW

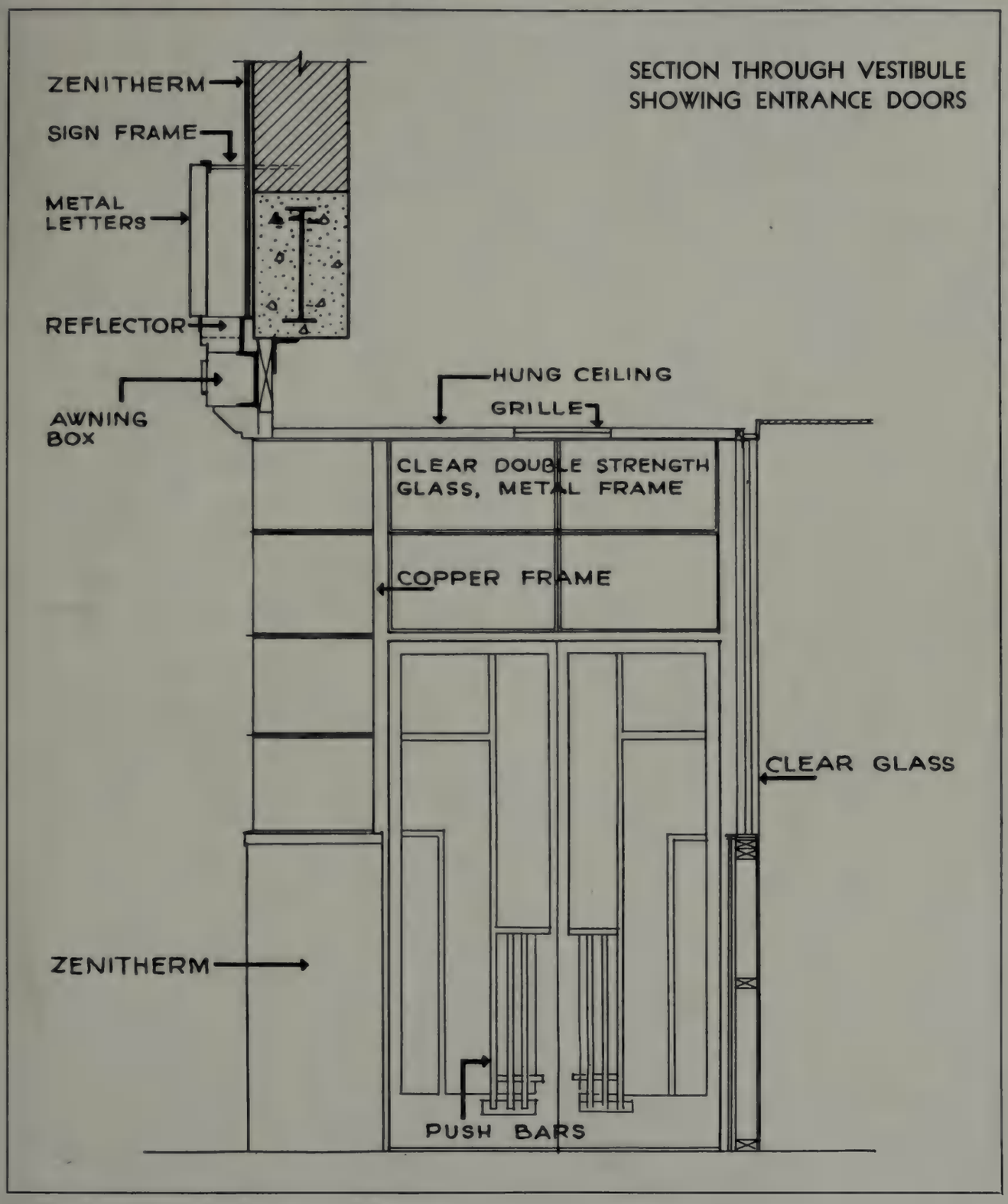
A sliding door has been devised by the General Electric Laboratories that opens and closes automatically. When a person approaches a door and comes within a proper distance it opens, and closes again after he has passed through the door opening. It operates by means of a photo-electric cell. "A ray of light is focused past the threshold of the door onto a photo-electric cell. This ray, when interrupted by the body of a person approaching the doorway, sets a hydraulic door-opener in operation. The hydraulic device is somewhat similar to that used in subway cars for opening doors." The door holds open for an adjustable period of time.

CHUTE TO BASEMENT

Boxes, barrels and even coal may be lowered to basement by a chute. The illustration indicates the construction of such a chute for the Hi-Hat Restaurant, by J. R. Davidson, architect, illustrated in this issue, pages 235-241. The slide is of concrete with side walls of T. and G. boards on studs. The lower part of the slide is faced with galvanized iron. A concrete buffer wall terminates the chute.

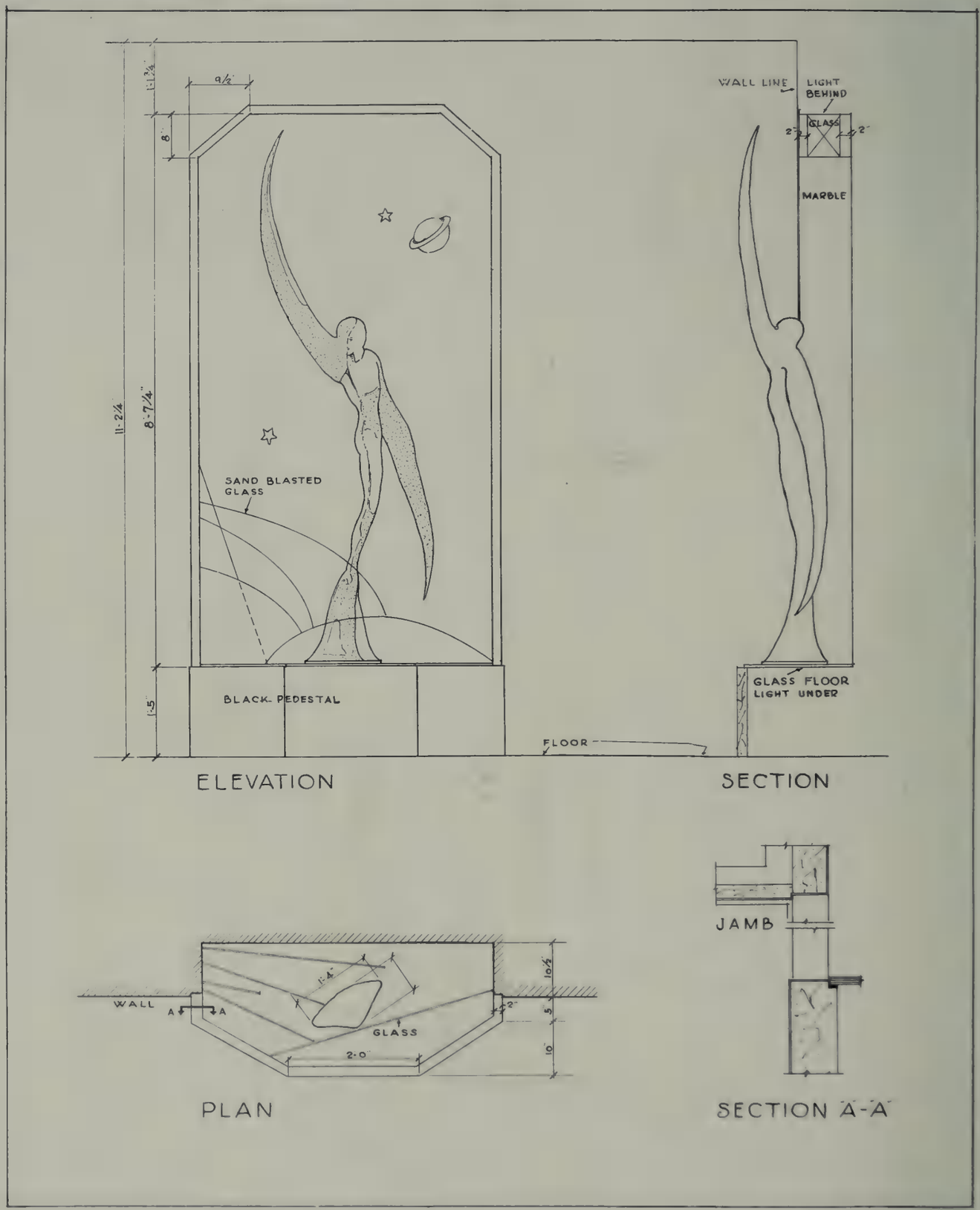


WORKING DETAILS



THE HI-HAT RESTAURANT,
LOS ANGELES
J. R. DAVIDSON, DESIGNER

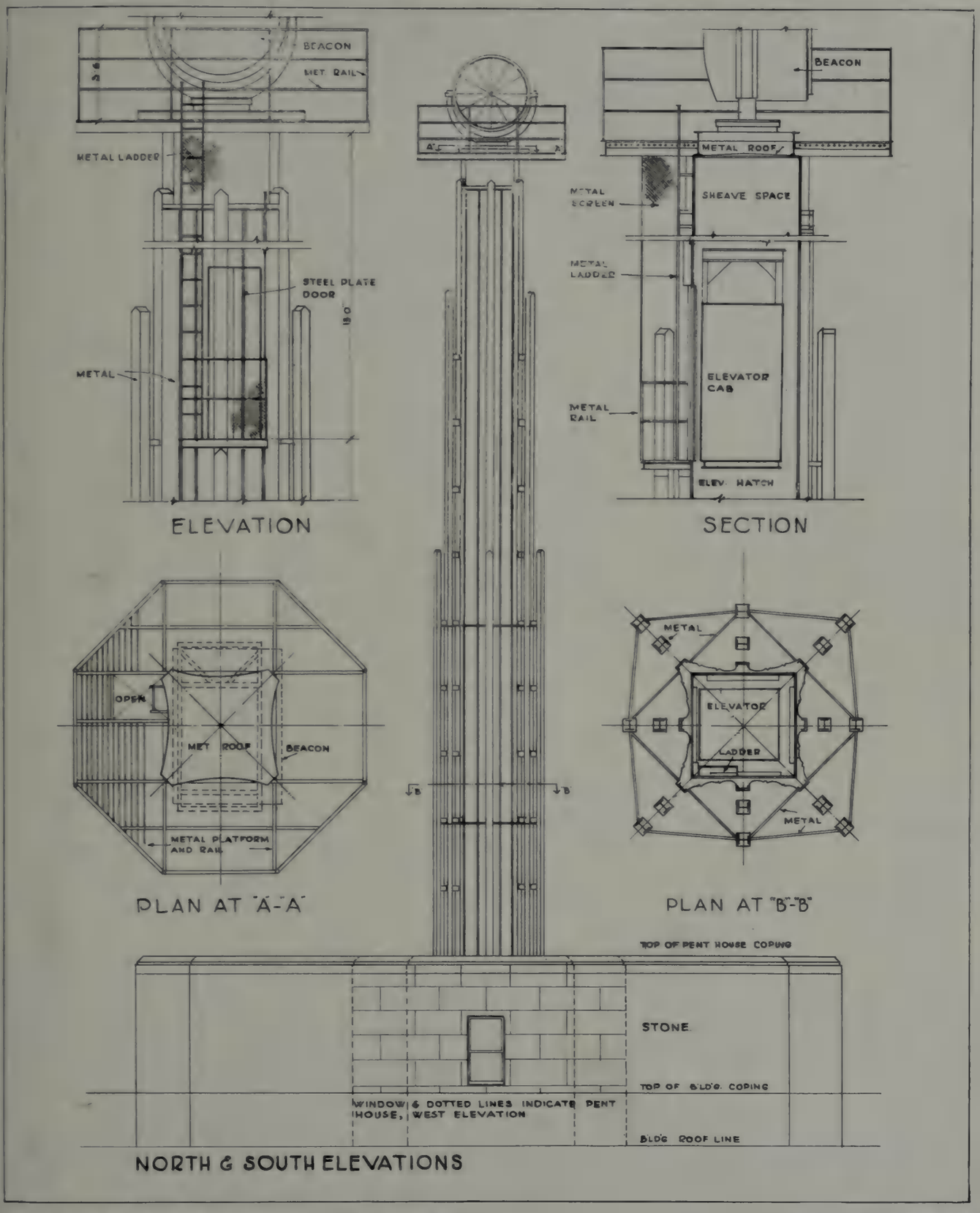
WORKING DETAILS



RAND BUILDING, MINNEAPOLIS, MINN.
HOLABIRD AND ROOT, ARCHITECTS

STATUE NICHE

WORKING DETAILS



THE PALMOLIVE BUILDING, CHICAGO
HOLABIRD AND ROOT, ARCHITECTS

AIR BEACON

UNIT COSTS IN OFFICE BUILDINGS

A recent report on office building construction showed fewer square feet of rentable space but an increased total construction cost. One cannot draw precise conclusions from such a report without more detailed information as to the character of the particular buildings involved, but it indicates what appears to be one of the results of the "modern" stepped-back type of construction, which is a higher unit cost per cubic foot and per square foot of rentable area. This general indication is borne out by figures given me by the architect of a building of this type under construction in Boston.

Our new law permitting this type of building was passed in 1927 as a permissible alternative to the flat 155′ limit otherwise still in effect. It permits construction above the 155′ limit providing all elements of construction are kept within an envelope developed by planes sloping back one foot for every 2½ feet in height, starting 125′ above the curb level, and applied to all lot lines, party lines as well as street lines. This creates a pyramidal form which permits a great increase in maximum height on large lots. A further restriction provides that the total cube of the building so built shall not exceed the cube determined by the "buildable area" of the lot multiplied by 155 feet. Thus the new provision permits no general increase in the cubic contents of the building except that the volume of the light courts, which would reduce the cube of the old style building, can be regained at least partially in the upper reaches of the setbacks, provided the lot is large enough.

I was interested to compare the figures of such a building with those for a building of the old style, 155′ high, on the same lot. They were given as follows in round figures: the buildable area of the lot was 20,000 sq. ft. which, multiplied by 155, gave the permitted cube of 3,100,000; the cube on a 155′ building would be 2,261,000 cu. ft; the cube on the setback building is 2,480,000 cu. ft. Here we find the older type would have obtained 73% of its permitted cube while the new type obtained 80%, a gain of 7%, equal to 219,000 cu. ft. Clearly a more intensive development of the lot.

In rentable areas, however, the figures were as follows: old style 213,347 sq. ft.; new style 220,600 sq. ft., a gain of only 7,203 sq. ft. The cube of the new style building increased 9.7% while the rentable area increased 3.4%. The rentable area for the old style building was 9.4% of its cube, that of the new style 8.9%. The increase in rentable area was only 3.3% of the increase in cube.

The conclusion is clear that more expensive rentable area is being built and therefore higher rents must be charged unless the smaller proportionate cost of the land offsets the increased cost of construction, which does not appear to be the case.

There are various obvious features of the upper setback floors that permit increased rentals per sq. ft.—light, air, quiet, corner rooms. These are good reasons for the "cost of high living" in our new office buildings, but we remember hearing a good deal about the economic necessity of high buildings.

The economic factor is evidently not cheaper unit costs of construction. The larger proportion of utilities in the upper smaller stories are clear confirmation of the increased cost per square foot of rentable area shown in the figures just quoted. Average cost per cu. ft. is also increased due to setbacks and added height above the ground.

The economic necessity appears to be the need of higher and more expensive buildings to carry the increased cost of the site, which is of course still further increased as a result of the opportunity afforded to build the higher and more expensive buildings.

One is irresistibly reminded of the phenomenon of a cat chasing its tail. Is this phenomenon being repeated in our present-day high buildings?

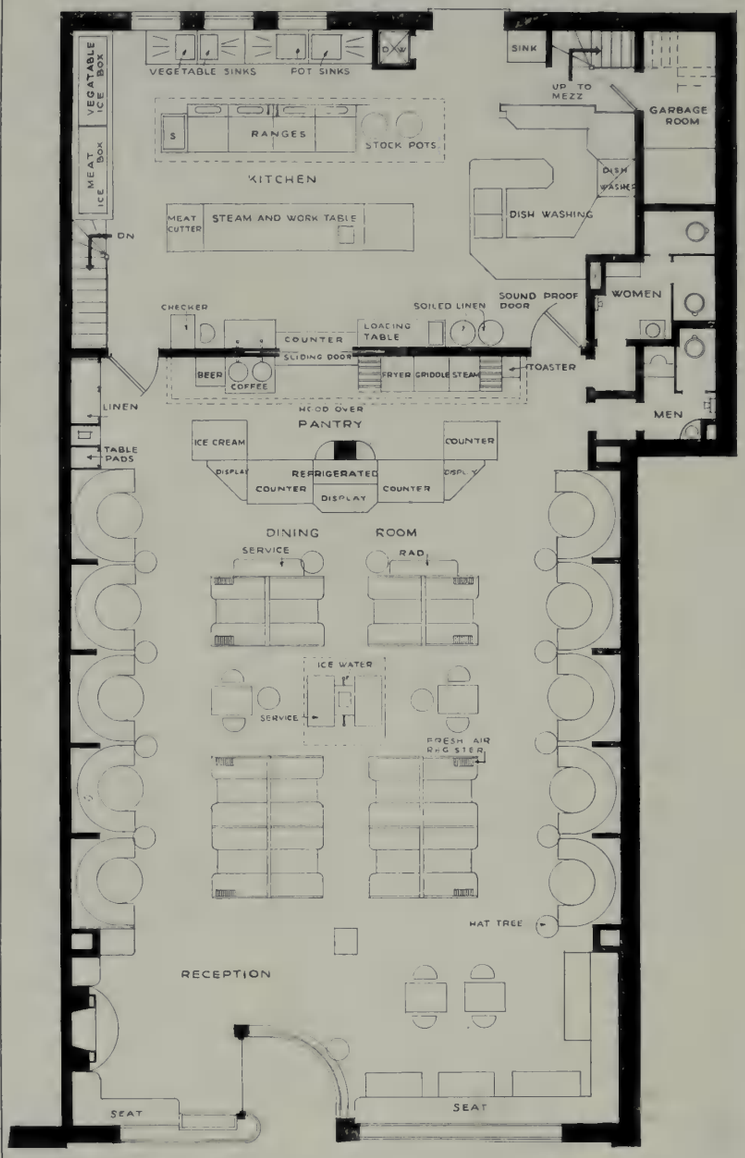
William Stanley Parker.



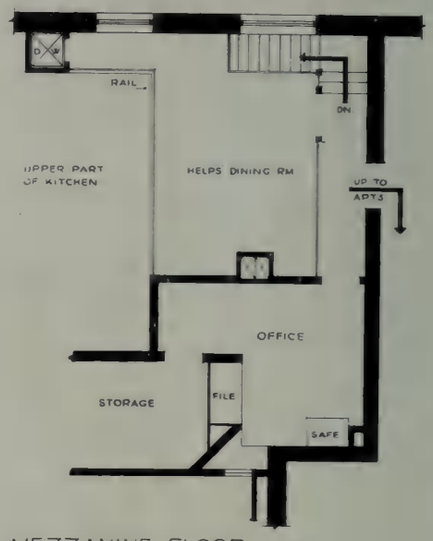
Morgan

RESTAURANT AT LOS ANGELES
J. R. DAVIDSON, DESIGNER

RESTAURANTS



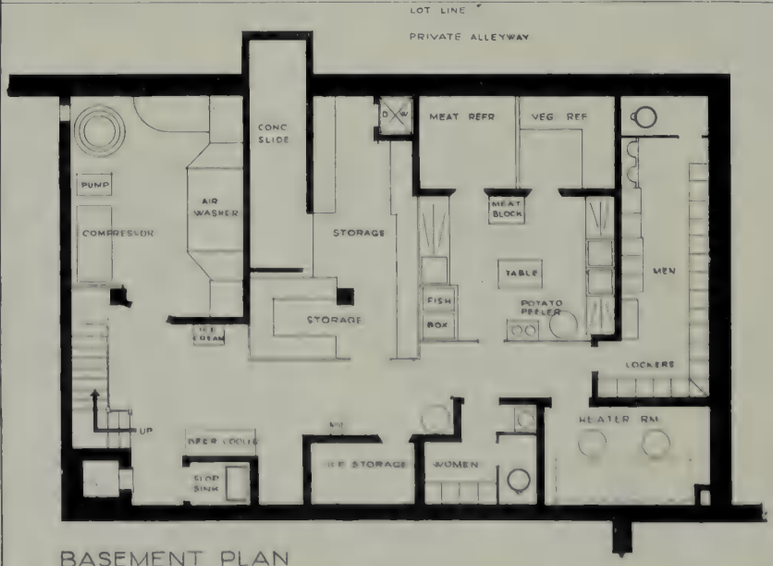
FIRST FLOOR



MEZZANINE FLOOR

THE HI-HAT RESTAURANT
LOS ANGELES

J. R. DAVIDSON, DESIGNER



BASEMENT PLAN

FLOOR PLANS



Morgan

DETAIL OF SIGNS
Copper letters against flush opal glass.

THE HI-HAT RESTAURANT
LOS ANGELES
J. R. DAVIDSON, DESIGNER



Morgan

THE HI-HAT RESTAURANT
LOS ANGELES
J. R. DAVIDSON, DESIGNER

Entrance showing use of Zenitherm blocks, glass, copper, steel and half-cylindrical Frink linolites on the rounded corner.



Morgan

Entrance door of copper and glass.

THE HI-HAT RESTAURANT
LOS ANGELES
J. R. DAVIDSON, DESIGNER



Morgan

THE HI-HAT RESTAURANT
LOS ANGELES
J. R. DAVIDSON, DESIGNER

DINING ALCOVES

Detail showing stepped cornice of redwood, behind which is the exhaust ventilation. Flower vases of Monel metal.





Morgan

Above . . . PANTRY: Counter of oak, copper moldings and insets of different woods. Display compartments of copper and glass. Greenish yellow tile in rear. Below . . . INTERIOR VIEW.

THE HI-HAT RESTAURANT
LOS ANGELES
J. R. DAVIDSON, DESIGNER



AN AMERICAN RESTAURANT
IN BERLIN
R. E. LEDERER, ARCHITECT



Kunstanstalt Voremberg

AN AMERICAN RESTAURANT IN BERLIN

R. E. LEDERER
ARCHITECT



C. Atelier Stone

AN AMERICAN RESTAURANT IN BERLIN

R. E. LEDERER, ARCHITECT



C. Atelier Stan

AN AMERICAN RESTAURANT IN BERLIN

R. E. LEDERER, ARCHITECT



C. Atelier Stone



C. Atelier Stone

AN AMERICAN RESTAURANT IN BERLIN

R. E. LEDERER, ARCHITECT



Courtesy of Albert Pick-Barth Co.

TECHNICAL NEWS AND RESEARCH

RESTAURANTS

By FREDERICK PUTNAM PLATT, ARCHITECT
and ROBERT L. DAVISON

ANALYSIS OF SUITABILITY OF LOCATION

There are two distinct conditions under which architects must concern themselves with restaurant planning. The first involves detailed planning and design of space for a particular restaurant. The second is encountered in designing commercial projects which must provide space suitable for subsequent rental to restaurant operators.

Before starting on a restaurant design, it is well to make an analysis of the problem, which will include:

a. An analysis of the neighborhood.
b. Rent desired.
c. Space available for use.

Analysis of Neighborhood to Determine Type of Service. An analysis such as follows, if prepared by the owner or renting agent, will assist in determining the type of food service that space should be provided for:

1. What classes of patrons are available—business and professional men, office men, office women, students, shoppers, theater crowds, factory men, factory women, laborers, farmers, auto tourists, out-of-town people, resort patrons, etc.? Which of these classes predominates?

Data have been assembled from practical experience in the planning and construction of, and research into, the requirements and conditions found in typical restaurant layouts in the larger clubs, hotels and public restaurants as well as the different forms of lunch rooms, cafeterias and restaurants adopted by the larger chain groups in New York and elsewhere.

The purpose of the article is to supply working principles of design and planning which, in the hands of the architect, will contribute to the creation of commercially successful restaurants of various types. We discuss three major types:

(A) Table service (public and hotel, large and small).

(B) Counter service (soda, sandwich shops and food bars).

(C) Self-service (cafeterias, automats, lunch rooms).

We express appreciation for cooperation of the following:

L. O. Rohland, associated with F. P. Platt and Brother, architects.

Miss M. Lewit, mgr., Coworkers' Cafeteria, L. Bamberger & Co.

Milton Lowenthal.

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Nathan Strauss & Sons.

2. Does heavy pedestrian traffic pass by? Is this traffic of a type which will stop to patronize a restaurant of the type contemplated?
3. Is auto traffic a factor and, if so, is parking space conveniently available, and are traffic regulations favorable?
4. For how many hours in the day is patronage available—24 hours, 18 hours, or short period? Can all three meals a day be served, or only one or two? How much between-meal patronage can be expected? How much evening and night patronage? Are the prospective patrons limited in the time during which they must eat?
5. Are violent seasonal fluctuations in trade probable?
6. Is the patronage dependent upon one single class of trade or upon many? Is the character of the neighborhood likely to be changed in the future, and if so, how?
7. What kinds of restaurants are already in the vicinity? Are they operating successfully? Is there more business than they can handle?
8. If the business is confined to one or two rush periods, will the idle periods eat up the profits?

Rent Desired from Space. As a rule of thumb, the owner expects the *ground floor rent* to be at least 6% of the cost of the land. Whether he can get this rent will depend on a number of factors, a very important one being provision by the architect for proper types and varieties of stores on the ground level. This will require preliminary analysis of the problem by the owner and rental agent in cooperation with the architect.

If a restaurant can not afford a ground floor location, it may be necessary to provide space in the basement. In large cities basement rentals suitable for restaurants will average $1.50 to $2.00 a sq. ft. To this must be added the cost of the street entrance, which may cost from $750 to $1,500 a front foot. A 10′ x 25′ entrance may cost $7,500 to $15,000, while a 100′ x 100′ basement space will cost only $15,000 to $20,000, making a total of $22,500 to $35,000 for a 100′ x 100′ space and entrance.

Some chain restaurants pay from 4% to 8%, depending on location and space conditions. A restaurant with a daily receipt of $1,500 in a profitable location and depending upon the type of service may pay 4% to 6% of its gross for rental, or $18,000 to $27,000 a year.

Space Available for Use. Practical areas and sizes for different types of restaurants in desirable locations in the larger cities:

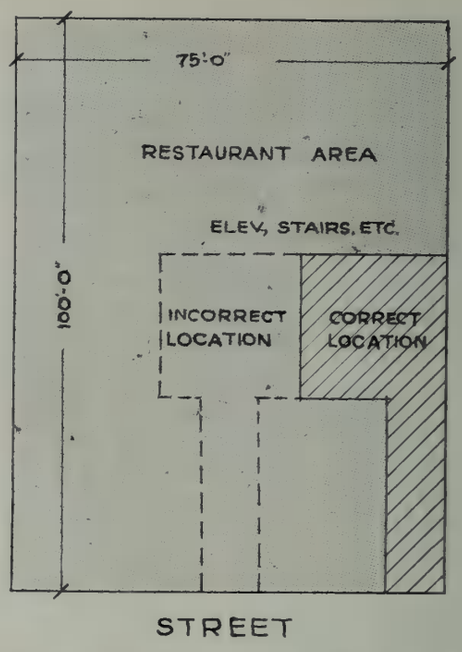
1. Small lunch room: 14′ x 60′ lunch bar; no tables. Space 18′ x 60′ will permit bar and one row of tables. Either will require approximately same area of basement for work space as restaurant seating 60 to 150.

2. Medium lunch room: 2,000 sq. ft. dining area, 2,000 sq. ft. work area; dining room 25′ x 80′, seating 150 to 200.

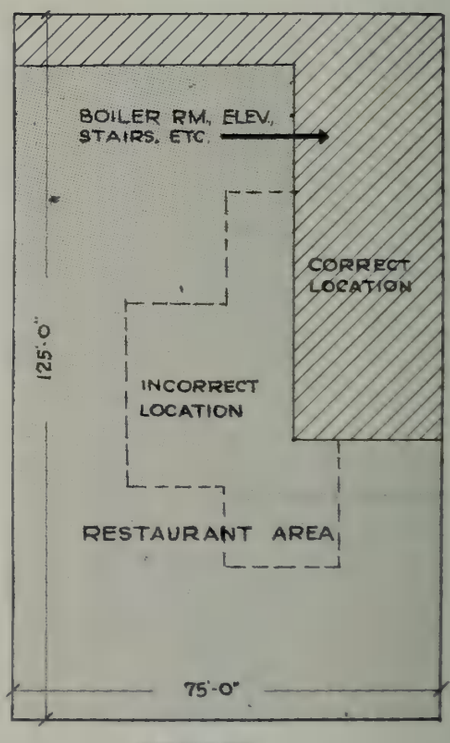
3. Cafeteria (better class): dining area 3,500 sq. ft.; work area 3,000 sq. ft.; dining room 35′ x 100′, seating 250 to 350.

4. Restaurant (higher class): dining area 5,000 sq. ft.; work area 4,000 sq. ft.; dining room 50′ x 100′, seating 350 to 450.

The above areas are approximate units in size developed from a survey of three of the larger chain-restaurant concerns of a large city. They represent the general requirements for the different types, such as lunch rooms, cafeterias, and restaurants.



Original plan of commercial building changed to make basement and first floor space more suitable for restaurant. Correct and incorrect locations of elevators, stairs, etc., are shown.



Frequently basement areas are needlessly cut up through failure to group service areas to side and rear. Preliminary plans of commercial building revised to give consolidated restaurant space.

Dining Room Areas. The shape of the room must permit a satisfactory dining room arrangement for the particular type of restaurant. The place under consideration should be sufficient to take fullest advantage of rush-hour business.

The entrance and store front treatment must be such as to attract business although the frontage does not always have to be so great in proportion to the total area as for other tenancy.

DETERMINING TYPE OF RESTAURANT SUITED TO PROBLEM

Types of Food Service. There are many distinct types of food services, but they may be grouped into three general classes:

A. *Table-service restaurants* are, of course, the oldest type and still hold an indisputable place as the highest class catering. Among their advantages are the most convenient method of service for patrons, quietness of service, pleasant social atmosphere. Among their disadvantages are slowness of service, which means fewer meals per seat per hour, high payroll and overhead, higher prices and the necessity of tipping.

It is not generally advisable to plan for waiter-service restaurants in floor space which, due to location and traffic, has a high potential rental value. Generally speaking, such restaurants cannot afford to pay as much for rental as counter service.

Waiter-service restaurants are holding their own, but are limited to locations where people can take their time at meals and are willing to pay a higher price for service.

B. *Counter-service restaurants* (lunch rooms, sandwich shops, soda fountains). Their advantages are rapidity of service, large number of meals per seat per hour, few employees, the ability to operate in a small space, 24-hour service with a small force, large volume in proportion to rent and investment, and low prices. Their disadvantages are the noisier atmosphere and the fact that many people, especially women, are averse to eating at a lunch counter.

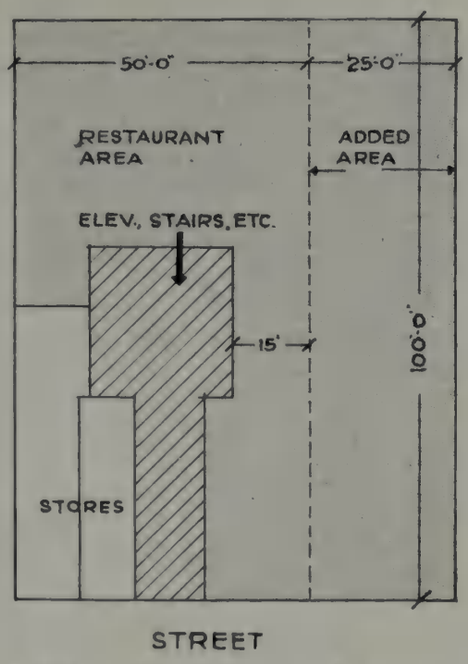
Due to the ability of counter service to make good earnings from a large volume of traffic, it can and does pay a higher rent per square foot of space than the cafeteria or waiter-service restaurant.

Lunch rooms are growing very rapidly in proportion to the industry in general because they are one of the best commercial methods of serving food, and can be operated successfully in the largest variety of sizes and locations.

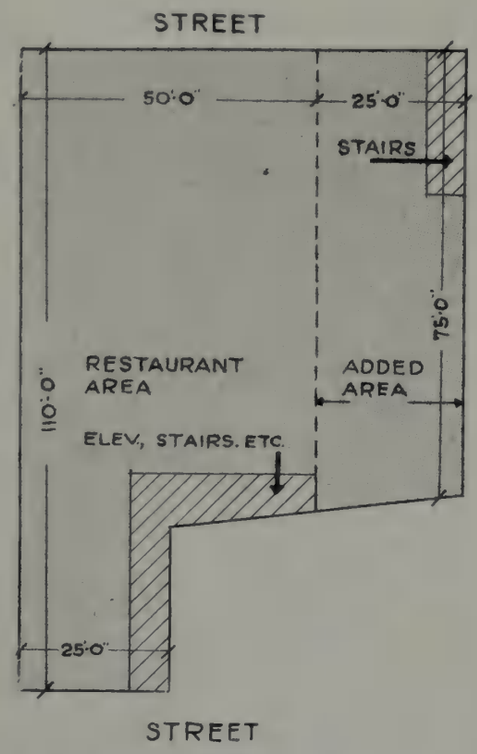
C. *Self-service restaurants* are undoubtedly the most efficient method of food service during rush hours, and have as advantages quick selection of food, rapidity of service, great drawing power for women's patronage, a large assortment of popular and profitable dishes, an appeal to the eye which builds up check averages, low operating cost, fewer higher-salaried employees for both cooking and service, reasonable prices and less necessity for tipping.

Where most of the cafeteria business is done only in the noon rush hours they cannot pay as much per square foot of floor space as lunch rooms. In high rental districts provision for cafeterias will generally be limited to basement areas.

Cafeterias, while extremely efficient in food service, are growing less rapidly in numbers than lunch rooms, partly because cafeterias must always be large in size, and partly because they are limited to certain general types of locations owing to the character of trade which they are best fitted to attract. Cafeterias are almost in-



Building where it was found necessary to add 25 feet of adjoining plot to make area rentable for restaurant.



Plot bought for restaurant purposes and found to be too small for a proper return. Adjoining property was added to make the venture sound and profitable.

variably found the best type of service for employee, school and other similar feeding problems.

Often a combination of two types, where both waiter service and counter service are used, is practical. Also in counter service restaurants a few tables with waiter service from the counter appeal to women and meet rush-hour demands without increased counter length.

REQUIREMENTS OF THE INDIVIDUAL DINER

Space Factors. Before starting to lay out a dining or lunch room it is advisable to determine the space required by the average person when eating. Consideration should be given to the average maximum and minimum dimensions of people so that, when possible, provision may be made for individual variations in size.

1. *Width.* The average person is 20″ across the shoulders. Allowing a minimum of 4″ clearance on each side, the minimum width of space occupied by a person would be 24″. This gives room for only a limited number of dishes on the table or counter in front of the diner. Where the guest may have several side dishes it is better to provide a width of 30″.

2. *Depth.* The average man, seated, measures 24″ from his back to the front of his knees. When seated comfortably at a table, approximately half of this distance is occupied by his legs under the table and the balance by his body and clearance from the table edge. In addition to this distance, the back of the chair slopes backward 2″ or 3″. Approximately 8″ clearance between the table and a chair are required for convenience in getting into a chair. As the chair seat will generally extend 4″ under the table it is advisable to leave 8″ plus 4″ or 12″ in rear of chair where comfort in getting into or out of chairs is desired. Where chairs of two adjoining tables are back to back 18″ will be found ample space if not used for an aisle. In the case of using stools in a room where space is limited, it is generally advisable to leave 18″ aisle space for persons passing in rear of seats. The dimensions required for *comfort* are the same regardless of whether chairs or stools, table or counter are used, since the position of a person's body should be the same in either case.

3. *Height of Chair, Table and Counter.* Most chairs are 18″ high and tables 30″ high. People (irrespective of their height) have become so accustomed to this difference in level between chair and table height that any variation from this position is uncomfortable. Therefore, it is important that the same relative position between a person's mouth and the eating surface be kept when counters are provided.

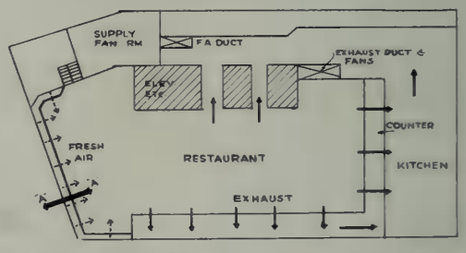
On this basis, assuming that the average man is 5′ 9″, the counter intended for use both when standing and with stools would be 42″ high and the stool 12″ less, or 30″ high.

There is a decided tendency in recent lunch counter design to lower the counters to table height and provide a seating arrangement which approaches, in comfort, that obtained with chairs. When this is done, it is generally advisable to counter-sink the floor back of the counter so as to eliminate the necessity of the waiters having to bend over while serving.

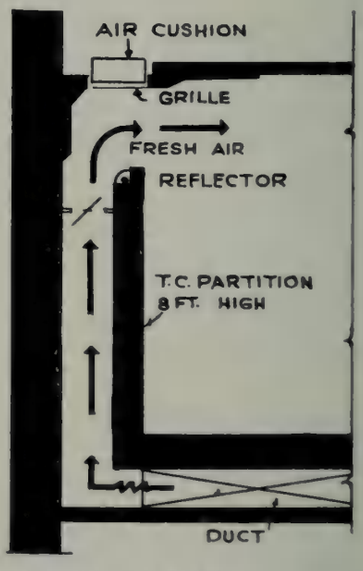
Where for structural reasons it is not desirable to lower the floor, the stools are sometimes placed on a raised platform, but this is to be avoided, as patrons will sometimes trip in getting off stools or the platform, and the lunch-room owner will be subject to damage suits. A better method is to provide foot-rests attached to chair or stool.



Rothschild



Horn and Hardart Cafeteria, New York City.
F. P. Platt and Bro., Architects.
All air should move toward the kitchen in order to prevent odors reaching the dining room. In this plan the fresh air enters the room from behind T. C. partitions as shown in photo above.



DETAIL "A"-"A"

Section through wall showing method of admitting fresh air. The air cushion is provided to prevent drafts from direct air currents. Note location of the light reflector.

Comfort Factors:

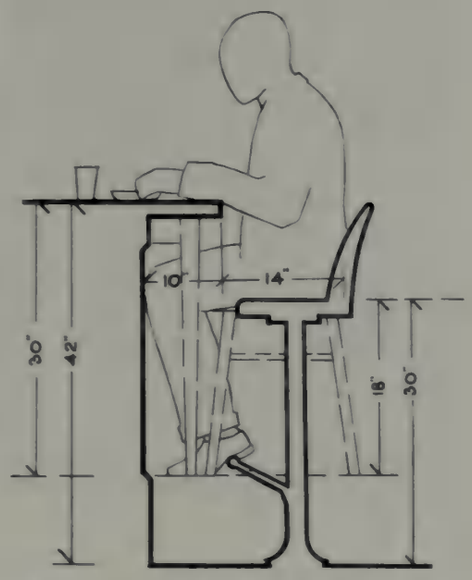
1. *Ventilation.* Proper ventilation in a place where food is served is so essential for the comfort of the patrons that very little need be said about it. Some recent restaurants show the importance accorded this feature by air-conditioning—including heating, cleaning, and cooling. It seems quite probable that air-cooling will increase patronage and stimulate the customer's appetite, but whether this increase will be sufficient to warrant the installation of such equipment will depend on type and size of restaurant. The Horn and Hardart Co., in several of their larger, popular-priced restaurants, have installed air-conditioning and cooling systems. Although the cost of installation and operation may make such a system impractical for the small restaurant, the slight increase in cost with increase in size of room may make it a very economically desirable adjunct in hotel or other large restaurants.

In considering the advisability of installing an air-cooling system in a restaurant, it is well to consider the effect that these systems have had on the attendance of movie theaters. It is quite likely that in the near future air-cooling equipment will be as essential for restaurants as it now is for movie theaters.

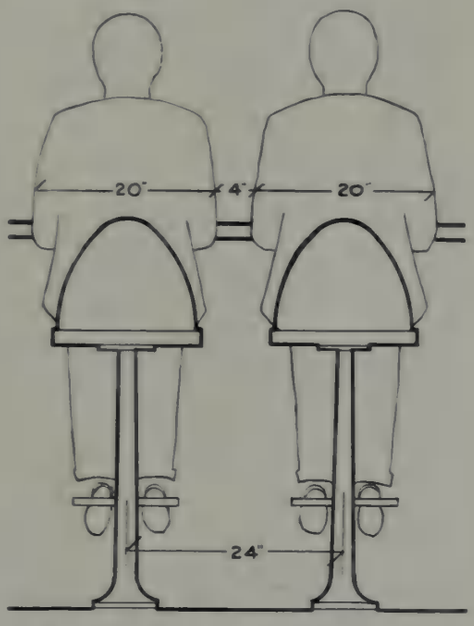
2. *Quiet.* A very important element in the provision of pleasing surroundings and one that is frequently neglected, generally by the owner on the grounds of cost, is the planning, construction, and equipment of a restaurant so as to prevent noise. This is an important item in any type of restaurant—from a lunch wagon to the most exclusive dining room.

Walls and ceilings should be covered with a resilient material. All service tables should be covered with a material such as rubber. There should be double doors between kitchen or pantry and dining room. Ventilating fans should be of the noiseless type or installed at some distance from the dining room, as the steady buzz of fans may create a subconscious annoyance. If the restaurant is on a noisy street it may be desirable to plan to keep the windows shut at all times and depend on artificial ventilation.

3. *Lighting.* This factor is of considerable importance in creating the right atmosphere. The amount of light desired will depend entirely on the type of patronage desired. For formal dinners and banquets it is generally desirable to provide strong lighting, and consideration should be given to avoiding glare. For restaurants catering to women, an amber-colored light is preferable, as it makes women look younger. Electric table lamps have certain drawbacks, complicating service and gathering dust, but are often used to create "atmosphere."



The diner's posture should be the same whether sitting at a table or counter.



Chairs or stools should not be less than 24 inches center to center.

ENTRANCES AND FRONTS

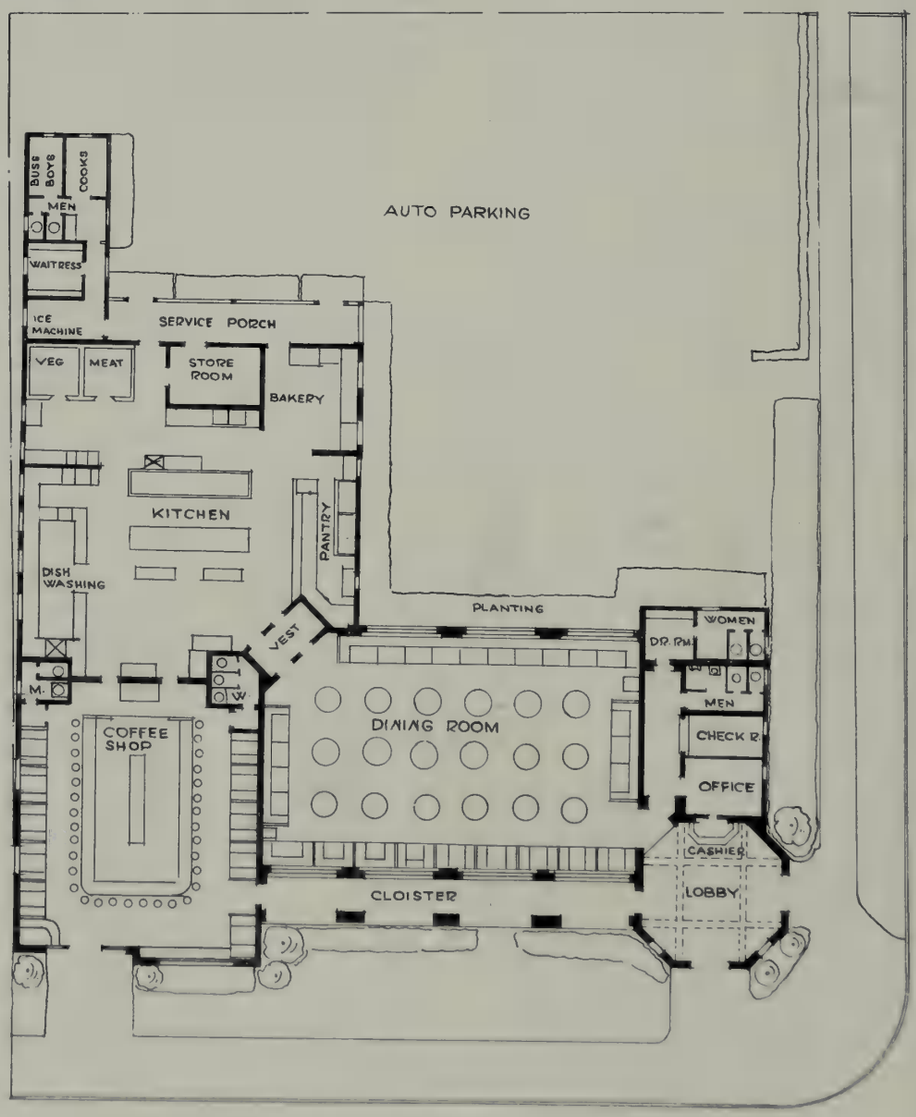
Restaurant entrances and fronts should be designed primarily to attract the patronage desired. Well-designed signs properly located are the most valuable method of drawing attention, except for restaurants catering to an exclusive patronage.

Show windows are essential for all except the more expensive restaurants, in order that the passersby may glance in and quickly determine the type of service offered. It is essential that the cheaper restaurants give the appearance of being spic and span but not expensive.

Display of specialty cooking in the window has often been used as a means of attracting customers. The cooking equipment is generally electric, gas plate or the rotisserie type. Where the window is not curtained or has no back to act as a reflecting surface, very



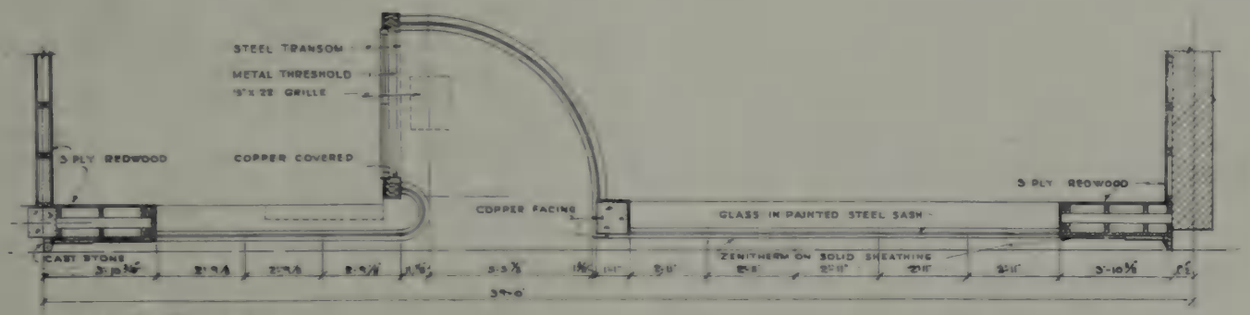
Mott Studios



DYAS-CARLETON CAFE
LOS ANGELES
GABLE AND WYANT
ARCHITECTS



FRONT ELEVATION



FLOOR PLAN

satisfactory results have been obtained by using etched glass as reveals illuminated by concealed reflectors.

An air of luxury may in some few localities be an asset, but in most cases people who patronize lunch rooms do so because they wish to save money, and a lunch room which has an expensive appearance will frighten away some potential patrons. This has been the experience of numerous hotels which have tried to conduct lunch rooms in surroundings that were suggestive of luxury and high prices.

It is equally important that higher grade restaurants display the character of their service. Cafeterias should be arranged so that the counter is visible from the street.

A special entrance problem arises when the restaurant is in the basement. The first floor space available is seldom over 10 feet wide, making show windows impossible. An effective entrance can be secured by setting the doors slightly back from the street, and flanking them with attractive showcases.

Since the patron enters directly into the dining space, except in the more pretentious restaurants having foyers, it is essential that diners be protected from draughts. Revolving doors are probably the best solution of this problem, but two sets of swinging doors usually will be satisfactory. Sometimes setting the inner door at the side of the vestibule and diverting the air currents will be advantageous. This also reduces the possibility of patrons passing through hurriedly and leaving both sets of doors open at once.

ENTRANCE DETAIL
HI-HAT RESTAURANT
LOS ANGELES

J. R. DAVIDSON, DESIGNER
(See pages 235-241)

DINING SPACE

Decorative Treatment Suitable to Class of Patrons. Appealing to the guests' tastes depends upon an analysis of the class of patrons as well as a knowledge of local customs and preferences. If the restaurant is one which caters to a general trade this may be a negligible factor, but in cases where a single definite type of trade predominates, it is exceedingly important.

Special consideration should also be given whether the class of patronage desired will be largely women or men. This difference is of such importance that in many restaurants, such as Schrafft's in New York and Grayling's in Chicago, separate rooms have been created in order to make a successful bid for patronage of the two classes of trade.

Dividing Dining Space. Except for dining rooms of a formal nature it will often be found that dividing the dining space into small units will add considerably to the attractiveness of the restaurant. This practice is being followed by some of the larger and more successful restaurants. Generally, the rooms are furnished and decorated in slightly different arrangements. These rooms may also be used for private parties. There is a restaurant in Berlin where each room is done in the style of a different nation and the food served to suit the national characteristics.

The division of the dining space into small units adds very considerably to the homelike character and eliminates a considerable proportion of the noise and confusion generally found in large restaurants, and if well planned permits a simpler service problem.

Balconies are a good solution where more tables are required and where ceiling height permits.

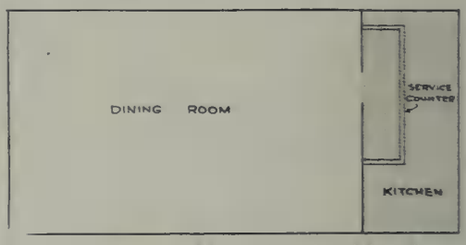
Stairs in the dining area for the use of the patrons should be commodious and of easy pitch. This is particularly important in cafeterias where a patron must carry his tray to a balcony table. A riser of 6½" and a tread of 11½" has been found very satisfactory. The location of the stair must be chosen so that it is prominently visible to the entering patron, and in cafeterias, from the counter also. For the same reason the railing should be of an open design. Directing signs are often a help in keeping balcony tables filled. For



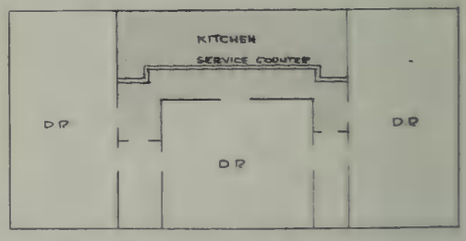
Tebbs and Knell

Note space lost by "atmospheric effects" in cafeteria, New Orleans.

FAVROT AND LIVAUDAIS, ARCHITECTS



Large rooms although suitable for formal or cafeteria service may lack homelike character.



Dividing the space into small units adds to attractiveness, simplifies service, and eliminates much of the noise and confusion of the larger dining room.



Nyholm and Lincoln

Stairs to balcony should be easily seen by patrons.

HORN AND HARDART RESTAURANT

F. P. PLATT AND BRO., ARCHITECTS

cafeteria mezzanines, an additional exit stair is advisable to avoid having descending patrons conflict with those ascending with trays. The materials of the tread should be of a non-slip nature, to avoid accidents and resulting claims; travertine marble and pre-cast terrazzo with abrasive aggregate have both proven very satisfactory.

Planning for Several Uses. It is not uncommon to have several types of eating places served from one kitchen. Often a grille and restaurant, or cafeteria and restaurant are served from the same kitchen.

The problem of planning the same dining area for cafeteria service during the day and waiter service at night is one which presents itself at times and which is solved only after a careful study of the peculiar conditions involved. Bamberger's Coworkers is a good example of a well-planned layout for dual use. In many cases, however, the dining room is separated from the service counter merely by a movable partition. There is also the condition in which the counter is closed off by a rolling screen. The waiter service, in this case, would be from behind the counter.

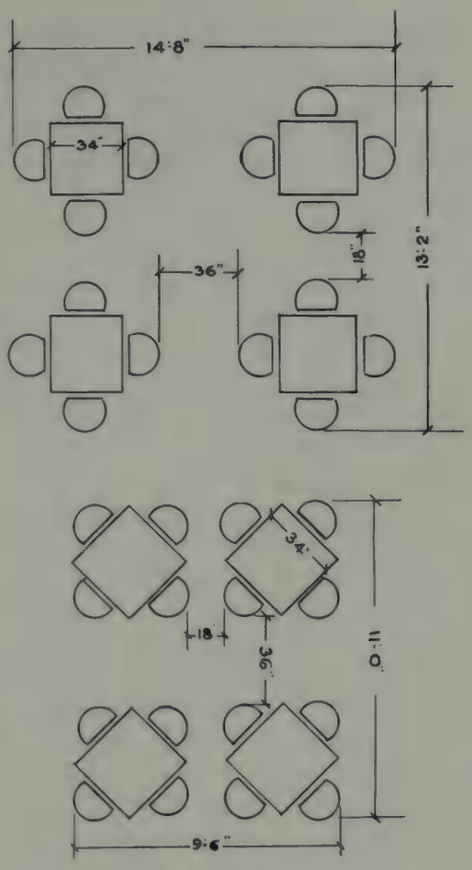
Table Arrangement. In planning the table layout it is well to provide an efficient assortment of sizes in order to have a minimum of partially occupied tables. For this reason it is always well to plan for a considerable proportion of tables for two. It is better to use two deuces, separated by 6″ to 8″ of space, than one oblong table for four. It has been found by experience that people will sit at seats 3 and 4, illustrated in Plan A, whereas they do not sit in seats 3 and 4 in Plan B, unless there are no other seats in the room. Tables for two should have one side equal to a side of table for four so that they may be placed together for a party of six.

For the class of restaurant which requires the maximum number of tables that can be placed in a given space consistent with allowing room for aisles, placing the tables at an angle will be found to add to the efficiency. The minimum size for an aisle in which service and patrons circulate is three feet.

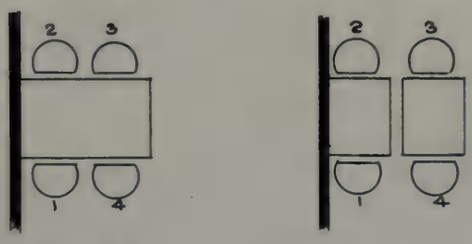
Where tables are placed on raised floors, or in mezzanines, it is well to place outside tables diagonally with the railing, as four-seated tables can then be used with space economy, and there is no danger of food or dishes accidentally falling through the railing. A diner seated parallel to a railing is likely to linger over his meal, watching action on the lower floor.

Wall benches have been used very extensively in European restaurants for some time. They are being introduced in this country and are proving to be quite popular in restaurants of the more social type. They occupy less space per person than tables for two but are not as economical of space as a table for four persons when located at an angle to the wall. However, they are objectionable for several reasons. A woman sitting on a bench will think nothing of occupying extra space with her hat and bag, whereas she will pick up her belongings when they are on another chair. Also it is easy to forget articles placed on a bench and perhaps most important, benches are hard to keep clean.

Booths will be found to be economical of space, but while they are popular in many restaurants, the experience of owners has been that they are not desirable in a type of restaurant where a quick turn-over is desired, as patrons, especially young couples, are inclined to linger over their meal. For this reason they should not be used in tea rooms or soda fountain lunch rooms which, because of location and rent, must have a high turnover of customers. Variety may be obtained by altering the table sizes to accommodate from two to six persons.



Tables placed at an angle occupy less space than when placed parallel.



Plan A **Plan B**

Two couples will occupy tables in Plan B while two separate parties will not occupy table in Plan A unless all other seats are taken.

TABLE-SERVICE RESTAURANTS

Since the main advantage of the waiter-service restaurant as compared with other forms of food service is not economy or speed but more pleasing surroundings and better service, full advantage should be taken of these factors in designing this type of service. The value of providing attractive surroundings is well recognized, but the influence which proper planning will have on the quality of service is frequently overlooked.

Sometimes when an exclusive type of patronage is desired, elements enter into the problem, over and above the requirements of good service in pleasant, comfortable surroundings, which are necessary to all good table-service restaurants. The restaurant might have the appearance of an exclusive and expensive place to dine. The architect can accomplish this by the use of materials, furnishings and embellishments exhibiting good taste.

COUNTER SERVICE RESTAURANTS

It is impossible to give rules for a counter layout since it is determined by the size and shape of the available area. In general the architect should strive to minimize movement. This requires a thorough understanding of the workings of a lunch room and a knowledge of the equipment used.

Counter Unit. Irrespective of the type of counter selected—straight, single or double horseshoe—it will generally be found that the counter or counters must be divided up into practically self-contained units of from 20′ to 24′ long. There are several reasons for this length.

In the first place it will provide standing or seating room for approximately 12 persons, which is the average that one waiter can serve with ready prepared food. If food or drinks are to be prepared by counter attendants, two or more men will be needed for the 20′ space.

In the second place, the soda and sandwich units require approximately 10′ each.

Thirdly, by having a complete subdivision into 20′ or 24′ units, confusion due to several waiters using same equipment is avoided.

There are three types of counter arrangements: the straight counter, the horseshoe or U-shaped counter, and the multiple horseshoe. The size and shape of the available space will generally be the determining factor in the choice of type of layout.

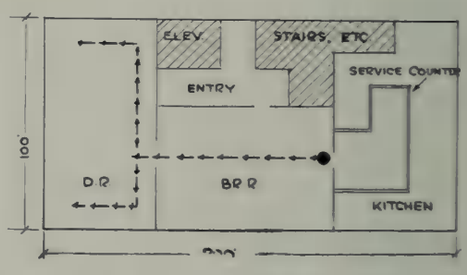
The minimum room width for a straight counter is about 15′, and for a horseshoe counter about 20′. Additional width can be used with both types by adding tables with waiter service.

The choice between supplementary tables and a horseshoe counter will depend of course on the probable class of clients. Generally, if the restaurant wishes to cater to women some tables will be desirable, whereas if the main appeal is to men, the counter should be preferable. With the installation of more comfortable counters and more attractively decorated lunch rooms and sandwich shops, the prejudice of women to counter service is being overcome to a considerable extent.

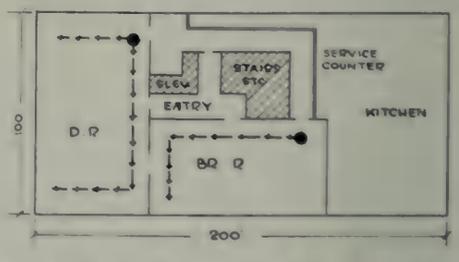
The multiple horseshoe type of counter not only gives a larger number of seats in a given space than can be obtained with the straight or single horseshoe type, but it improves the efficiency of operation because one waiter can be assigned to care for a single horseshoe, generally planned to seat twelve customers. With only one waiter to a unit, confusion is reduced and if the equipment is properly planned, the distance to be walked by the waiter is reduced.

DIAM.	SEATS	TABLE AREA PER SEAT
24"	2	1.5 ⊄
30"	3	1.63
34"	4	1.76
42"	5	1.92
48"	6	2.09
54"	8	1.98
60"	10	1.96
72"	12	2.35
84"	14	2.74
96"	16	3.14
SODA & SANDWICH TABLE		
26"	4	.93 ⊄

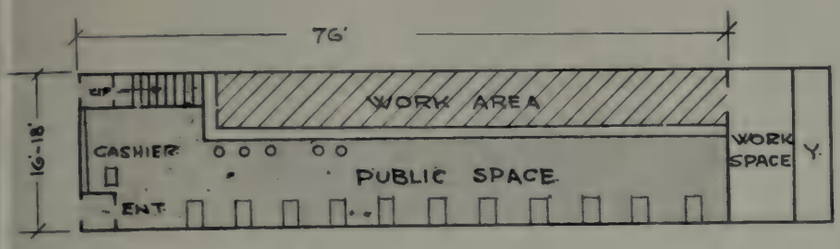
Area of table per seat per person accommodated at round tables of various diameters, allowing 18" to 20" per person.



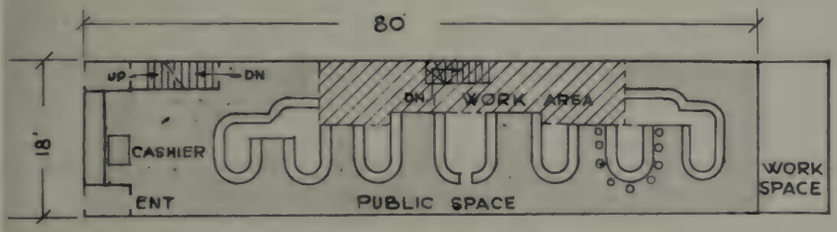
Poorly planned space in recent building. Waiters have to walk an excessive distance. A waiter near the kitchen can handle 12 patrons while one covering tables at end of dining room can only serve 6 patrons.



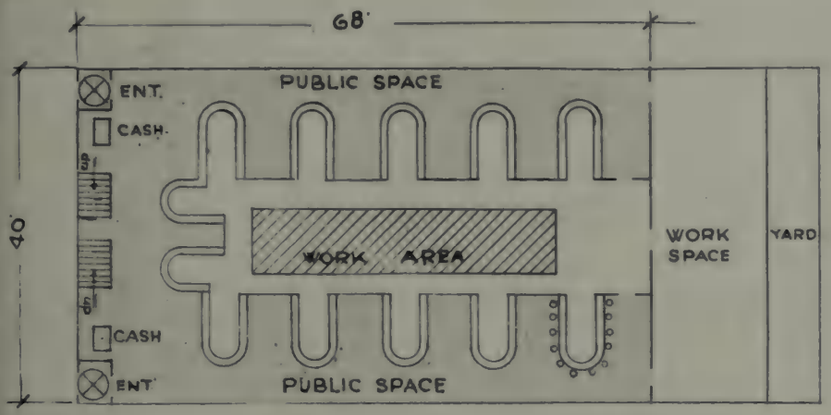
Above space redesigned to provide efficient waiter circulation.



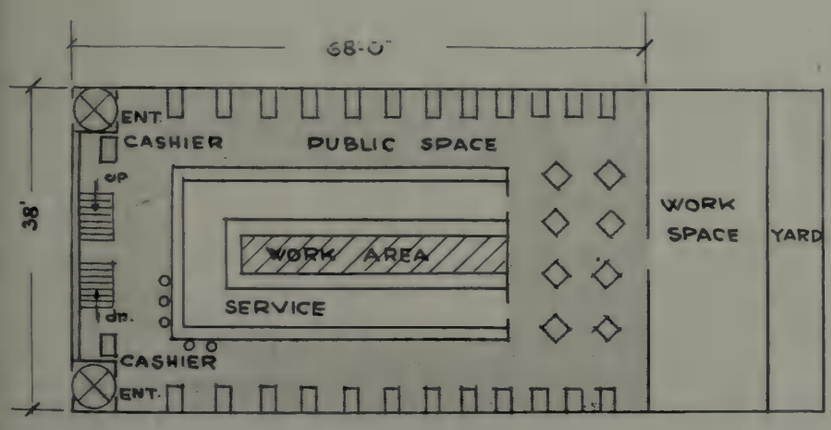
Straight counter arrangement. Suitable for narrow rooms.



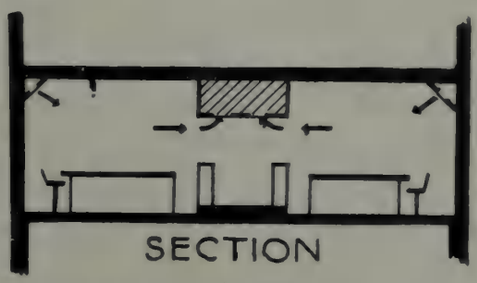
Multiple Horseshoe generally preferable due to increased number of seats and greater efficiency in service.



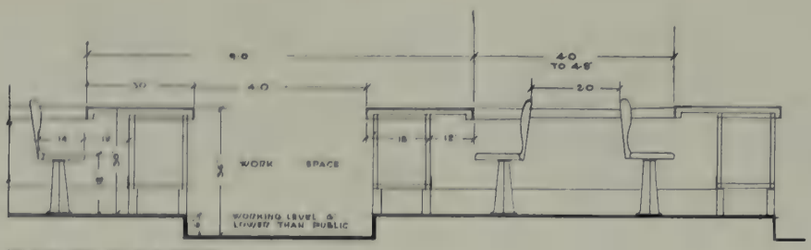
Double Multiple Horseshoe. Very efficient utilization of space. Twelve persons are generally the average per unit.



U-shaped counter for larger room with kitchen in center.

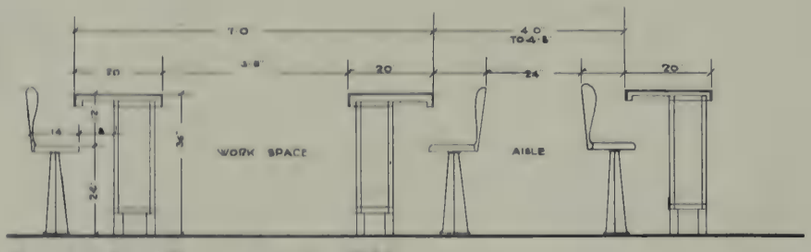


Ventilation through kitchen.



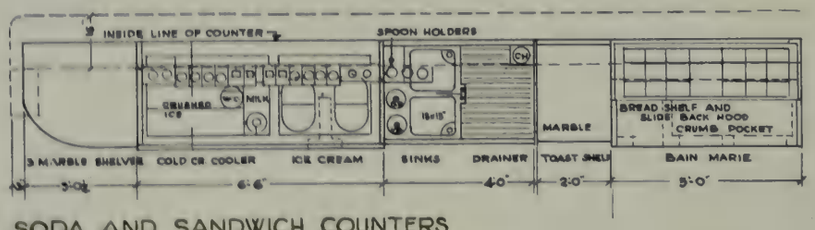
DINING COUNTER

Table-height counter, 30" wide with countersunk service floor, for attracting better class of patrons.



SANDWICH OR LUNCH COUNTER

Narrow top suitable for sandwich shop and quick lunch counter.



SODA AND SANDWICH COUNTERS

Units average about 10' in length. Counter length is increased by units generally in proportion of one sandwich unit to two soda units.

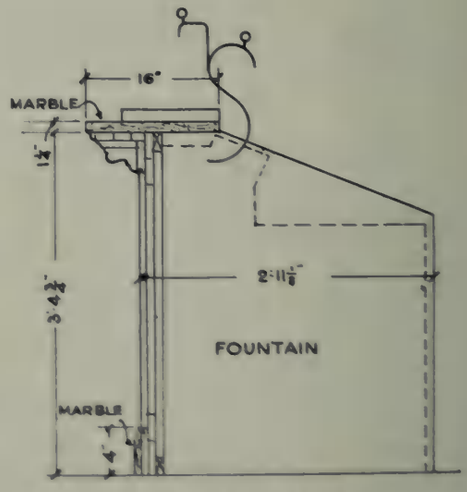
The horseshoe counter, which brings the customer within arm's reach of a waiter, is an efficient solution of the service problem. However, the problem is not wholly solved unless the same reasoning is applied to the planning of the entire room, counters and equipment. Each condition is a new and different problem.

SELF-SERVICE RESTAURANTS

The general principles of table arrangement, outlined above, apply to cafeterias except that spacing can be somewhat closer than in table-service restaurants. Commodious aisles should be provided for the main circulation, which should be carefully studied to avoid conflicting lines of traffic. Booths and alcoves are unsatisfactory in self-service restaurants as patrons should be able to see vacant seats from counter.

The seating capacity should be carefully studied as it will control the length of the counter. Since guests remain an average of 20 minutes at a table the hourly capacity of a dining room is three times its seating capacity. But it is always advisable to provide an oversupply of chairs (20 to 25%) in order to provide places for parties of two or more who are desirous of being seated by themselves.

Cafeteria guard rails forming aisles at counters should be at least 5' 0" from edge of trayslide.



SECTION THROUGH SODA FOUNTAIN

Counter dimensions are limited by effective arm's reach of the operator.

Where unrestricted access to the counter is desired, columns, tables and other obstructions should be kept at least 6′ 6″ from counter front.

Tables with supplies of silver and napkins should be located in line of traffic. Where tables are placed against walls of material that would show stains, chair rails are advantageous at table level to act as a mopping strip when bus boys clean off table.

Drinking water fountains should be conveniently located just off normal lines of circulation. Where balconies are used, a location near foot of the stairs has proven very desirable. Supplementary fountains should be placed on balconies and also on main floor when large in area. It is generally unwise to locate the water at a continuation of the counter, as a congestion there would hold up the counter traffic.

Where possible it is advantageous to locate the glass washing equipment contiguous to the fountain, as most of the used glasses are left at the fountain. Where glass washing is done elsewhere, it is essential to have sufficient racks to hold a plentiful supply of glasses. In some locations paper cups have proven satisfactory and economical. The fountain should have an ample-sized drain shelf to prevent water splashing on floor.

Dairy lunch rooms come under the classification of self-service restaurants but serving a smaller variety of food than cafeterias. Since they have a capacity generally under 100, less counter space is required.

The orthodox seating arrangement which is employed in self-serve lunch rooms consists wholly of arm chairs. There are many variations, however, some operators using combinations of arm chairs and tables, and others working out a special type of seating arrangement by the use of narrow counter-height tables, with high stools, chairs or benches.

Cashiers' booths are usually located near entrance to control outgoing patrons. When cashiers also act as checkers in cafeterias the booth must be located at the end of the counter. The best location for the cashier, particularly when he also tends a cigar counter, is often hard to foresee, and booths should preferably be made portable so that adjustment may be made after restaurant circulation has been observed.

Coat and hat checking rooms or racks are seldom used except in table-service restaurants of better class. Hooks for hats should be placed under the stools or chairs, coat hooks on the walls, intermediate stands in large dining areas and, in addition, some counter-service restaurants have provided a second shelf under the counter where patrons can lay bundles.

SERVICE AREA

It is on the efficient locating and planning of this area that depends the speed and efficiency of the food service which, next to the quality of the food, is probably the feature most important to the patron.

1. *Table Service Restaurants.*

Handling of waiter traffic in service pantries or in hollow rectangular space in kitchen should be for right-hand (counter-clockwise) service, if possible. A subveyor or window for receiving soiled dishes should be located just inside entrance from the dining room. The range and boiler section should be located on the right; next to it



Rothschild

Drinking fountains should be off normal lines of circulation, but conveniently located.

should be located the cold or pantry service; the pastry counter should be located on the opposite side and the checker's desk at the door. The center of the room should have shelves and heaters for silver, dishes and other supplies.

The aisle between the service counters must be made amply large to accommodate the number of waiters whom the dining room will require. For example, a dining room for 300 people will require 25 waiters and at least half of them will be in the kitchen at the same time.

2. *Counter Service Restaurants.*

Since *speed in serving* is the main advantage of the lunch counter as compared with other types of food service, every item in planning and design should be analyzed from this standpoint. It would be ideal if all items needed for a meal could be placed within arm's reach of a waiter serving a customer, but this is obviously impossible. It will be necessary to have a portion of the food at some distance from the waiter, either kept in a back counter, a back cooking counter, a kitchen separated from the lunch room by a partition or in the basement and connected with the lunch counter by dumb-waiters.

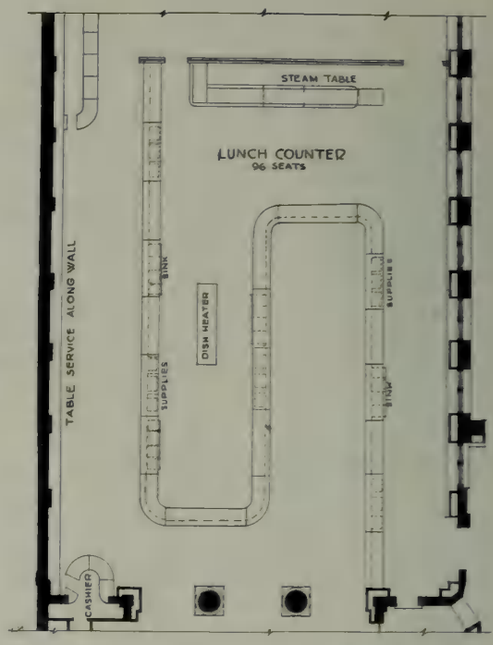
The counter should contain provision for the following items within arm's reach of the waiter:

A tray for clean water glasses.
A tray for clean cups and saucers.
Service plates.
Compartment trays for silver.
Hot plate for coffee pot.
A container for counter towels.
Tray of cream pitchers.
Ice compartment for drinking water and coffee cream.
Bus tray for dirty glasses.
Bus tray for dirty dishes.
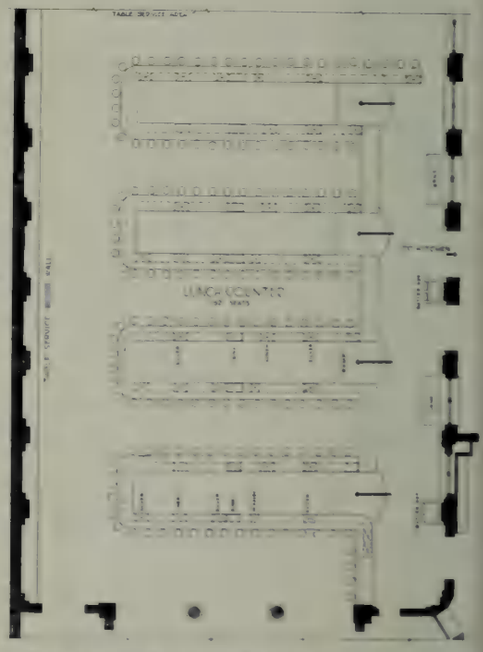
The ice compartments are located in the center of the unit to be easily accessible and all the equipment should be on the top shelf to minimize bending over and straining for the attendant. Bottom shelves can be used for surplus equipment. Shelves should be as open and clear as possible which makes them more easily reached and kept clean.

When *a showcase type of lunch counter* is used, salads and desserts may be kept in the front counter. There are two types of showcase counters: either a glass top counter with the food displayed underneath or a small glass enclosed showcase at the back of the counter. The glass top counter is not entirely satisfactory as the glass scratches chips or cracks and is quite noisy.

Rear counters are practically always used with soda lunches and with the straight type of lunch counter. This rear counter will contain the refrigerator, drawers or tilting bins for the storage of crackers, bread and hard rolls, shelf space for storage of sandwiches, screened or glass-enclosed space for pies, salads or desserts, toaster, coffee urns, etc., as well as space for the storage of linen, china and glassware. With the horseshoe and multiple horseshoe counter there is a tendency to eliminate the back counter from within the horseshoe entirely, or place it at the end of the horseshoe or in the space connecting the various units in the multiple horseshoe. Two feet wide and three feet high is standard for back counters. Where long back counters occur, service and equipment units should be duplicated every twenty feet.



ORIGINAL PLAN: 96 SEATS



NEW PLAN: 152 SEATS

SAVARIN LUNCH COUNTER PENNSYLVANIA STATION, N. Y. C.

Restaurant service greatly improved by use of multiple U-plan counters. Service simplified and 56 additional persons accommodated.

Sandwich Shop. The requirements for the sandwich counter are but very slightly different from those for a lunch counter. No room needs to be provided back of the counter for bread or crackers but otherwise there is no major difference. In the sandwich shop the kitchen is generally entirely eliminated, aside from provision for washing dishes. Sandwiches are made at a service counter in the lunch room.

Counter Construction. Counters may be had in wood, marble, glass, tile, metal and several synthetic materials.

Counter tops also may be had in a variety of materials. The choice will depend at times on the class of trade catered to. Rubber is the quietest but it is subject to damage from some acid fruit juices and certain soaps or cleaning fluids, and unless specially treated it will show burns from cigarettes. Linoleum is quite similar to rubber but requires the application of a finish to keep it looking well. It is also damaged by cigarette burns. Formica is not damaged by cigarette burns nor fruit acids and has many advantages as a counter top but it is not as quiet as rubber or linoleum. Glass is noisy and is easily scratched and chipped. Marble is noisy and discolors readily if light in color. Wood is seldom used as a counter top as it is too easily marred and damaged.

The counter may be mounted on sanitary legs or have a baseboard.

3. *Self-Service Restaurants.*

The counter should not be started too close to the entrance, since no successful cafeteria is able to handle patrons as fast as they arrive during the rush hours, and they must be provided with a space inside the room to stand during this waiting period.

The counter should be placed in front of the wall separating the dining room and kitchen. This enables service slides and doors to be arranged conveniently for bringing replenishments to the counter. The counter should be used for service only and is not intended as a place for preparation. Even the cutting of cakes and pies should be done in the kitchen. Unless the kitchen must be far removed, no equipment for preparation should be placed back of the counter on the dining room side. If it is necessary to have these service supply stations because of a remote kitchen, it is better to build a service pantry back of the counter, fully partitioned from the dining room.

Length of Counter. It has been discovered from experience that increasing the length of service counter above approximately 75′ will not increase either the number of people served or the check average. Two lines should be installed if the capacity of the dining room is greater than can be handled by one line. One hollow square 80′ long will require two aisle type counters on each side of the room, meeting at the center with an elaborate cold display serving both lines. The hollow square eliminates halts in the line due to indecision on part of patron or slow service at any one point. The hollow square type at Bamberger's replaces one having a 7′ wide aisle which would have permitted patrons passing congested points but, unless the jam was serious, the customers would seldom get out of line.

An 80′ counter of the aisle type layout has a capacity of approximately 600 persons an hour and the hollow square approximately 900 an hour. Lesser lengths have capacities nearly proportional to their lineal feet.

Counters generally have four departments: (1) salads and cold meats; (2) hot meats and vegetables; (3) pastry and desserts; (4) ice cream, and cold and hot drinks. It has been found that an equal







RESTAURANT IN LOESER DEPARTMENT STORE, BROOKLYN

Layout by Duparquet, Huot and Moneuse

allotment of space to each of these four departments nearly approaches the ideal, with the steam table possibly getting a little more than its share.

There are differences of opinion as to the order in which they should appear but as a general arrangement the salads should precede the steam table, the pastry following and the drinks served last. The reason for this sequence is that since the slowest service is at the steam table the line is halted in front of an attractive array of salads where many orders are sold which would not be taken later. If the hollow square layout is used, a sandwich counter in the center of the square will be found an efficient arrangement.

A soda fountain, oyster bar, short-order range or other means of preparing any food or drink is generally not satisfactory as a part of the counter or on the dining room side of the wall back of it. Any preparation of orders along the counter delays the line.

Cafeteria Counter Construction. Such fixtures as steam tables, cold pans, refrigerated cabinets, refrigerators, etc., should be built as separate units if the counter is to be faced with glass, tile or other materials which are affected by variations in temperature.

The recommended practice is to use 8″ sanitary legs for all cafeteria service counters. This offers sufficient space for cleaning underneath the counter. Some operators desire service counters to be installed with a base extending to the floor. This makes access to pipes difficult, and thorough cleaning is almost impossible. It is very important that pipes, when not installed under the floor, be kept at least 9″ above the floor to permit ease in cleaning. It should be remembered that the cafeteria counter handles food and that particles of food are bound to get underneath the counter.

The tops of steam tables should be planned to permit standardized variation and interchangeability of pan sizes. The accompanying details of the steam table to be used in Bamberger's cafeteria show how the pan opening may be divided into half or quarter sizes by the use of interchangeable units. In this restaurant they have found



SAVARIN RESTAURANT,
GRAYBAR BUILDING, NEW YORK
A. P. JASPERSON,
RESTAURANT CONSULTANT

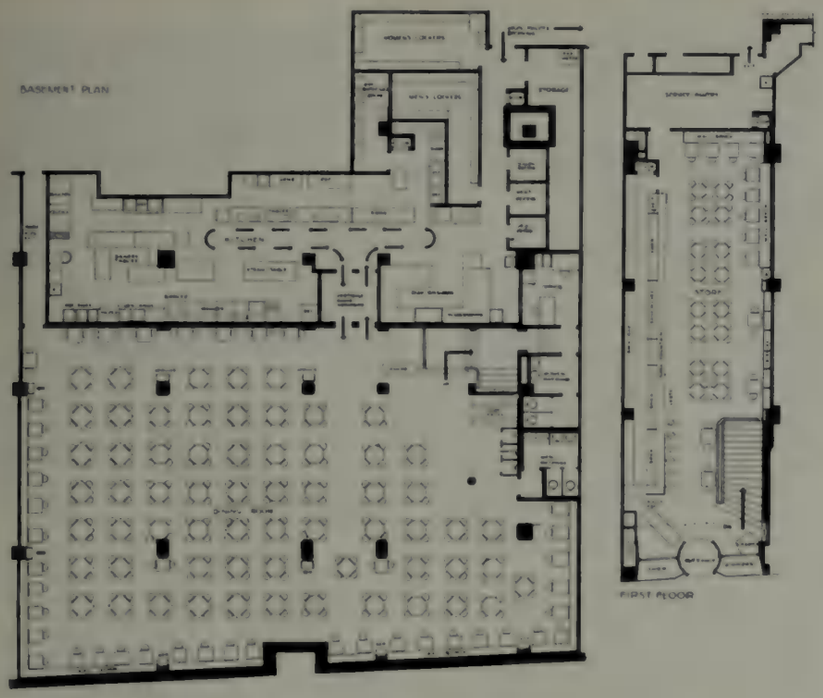
Counters at table height, 30″ wide, with service floor countersunk.



Rothschild

← Cafeteria Counter.

HORN AND HARDART RESTAURANT
F. P. PLATT AND BRO., ARCHITECTS



ACKER-MERRALL RESTAURANT
NEW YORK CITY
F. P. PLATT AND BRO.

Soda bar and light lunches on street floor; restaurant in basement, extending under sidewalk and adjoining stores. Note the service circulation in relation to kitchen functions.

that Monel metal pans with their tops flush with the top of the steam table are more satisfactory than the crockery type frequently used.

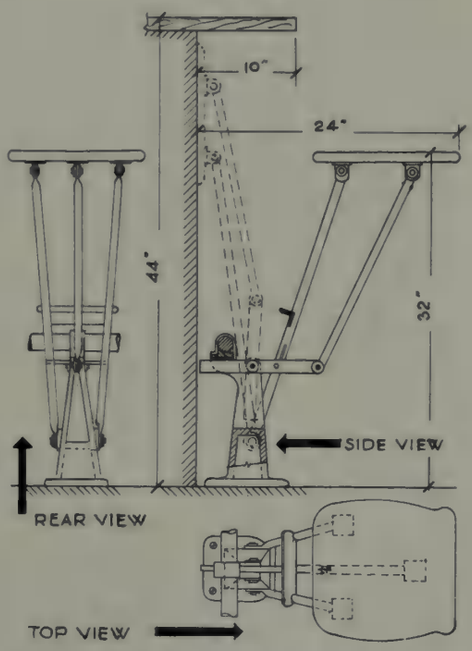
Cleanliness is greatly facilitated if the shelves under the counter are made easily removable, either as separate shelves or attached to legs with the whole unit easily portable.

The counter tops are subject to considerable variation. Glass is used a great deal but it has the disadvantage of being easily broken, not only due to wear and tear but as a result of the heating and cooling of parts of the counter. For this reason a large proportion of cafeteria counter installations now have metal tops, and for this purpose Monel metal has been found to be the most satisfactory.

Removal of Soiled Dishes. Wherever a basement is possible and expense permits, the automatic subveyor, centrally located and facing away from the front of the room should be installed. In addition to doing away with one of the most objectionable features of cafeteria operation, namely the stack of soiled dishes in the dining room and the noise of their removal from the room, a subveyor will in time pay for itself in the saving of breakage. By this means the dishes are delivered steadily in small quantities directly to the level of the soiled dish table instead of coming in boxes which are emptied in a manner which chips and breaks them rapidly. Even where the dish pantry is located on the same floor as the dining room, conveyor belts at the side of the room, or extending up to ceiling and down, or below the floor and up, are now being installed and operated with much better satisfaction than can be obtained with the truck.

WORK AREA

The work area may require from 25% to 50% of the total gross area devoted to dining and food preparation. This area will include, in addition to the kitchen portion, store rooms, refrigeration machine rooms, receiving room, help's lockers and toilet rooms, ventilating equipment room, dish and silver washing, etc. The kitchen itself very often will occupy an area equal to 15% to 25%



DETAIL OF COUNTER SEAT
AMERICAN RESTAURANT IN BERLIN

Design patented by R. E. LEDERER
(See pages 242-246.)

of the dining room area. The accompanying table gives typical examples of floor space requirements. Very large restaurants find it necessary to provide a far larger relative kitchen and work area, because the menu is usually much more extensive as is also the amount of space devoted to bakery, ice cream making, storage and other sub-departments. For instance, the Palmer House in Chicago has 40,200 square feet of work area (including storage, etc.) as compared with 43,842 square feet occupied by their dining room.

Location of Work Space and Kitchen. The work area, from the standpoint of efficient operation of the restaurant, should be located directly adjoining the dining room, but on high priced land this will not always be economically desirable. On land exceeding $100 per square foot (that is, a potential rental of $6 per square foot) it will generally be advisable to provide for the kitchen in the basement or on mezzanine floor. It may be possible to effect a compromise by having store rooms, storage refrigerators, food preparation rooms, bakeshop, and at times the dishwashing department, separated from the main service kitchen and placed on another floor. This, of course, is only feasible if there is excellent provision for transportation of supplies, food, etc., between the separate parts of the kitchen. In such a case a scheme should be worked out as an individual problem with a competent architect and consultant.

Use of Basement Space. There are three methods of making use of the basement space directly under a restaurant. The first, using it for store rooms and storage refrigerators, offers no particular complications to restaurant operations if adequate facilities are provided for conveying large boxes, etc., into the basement and from the basement to the kitchen.

The second method is to use the basement for both storage and the dishwashing department with conveyors or subveyors to dining or lunch room. There are many advantages to be gained from this segregation of the dishwashing department which is always a disturbing factor in the kitchen, both because of its noise and because of the space it takes up in the line of service.

The third method is to locate the entire kitchen in the basement. This is generally undesirable but where land is so expensive that it must be done, provision should be made for ramps, conveyors, and stairs with easy rise and tread.

Lighting, Ventilation, etc. Natural lighting is always desirable and sometimes local laws make it compulsory. Kitchen windows should have at least four feet clearance between the window apron and floor.

No matter how small the room, the removal of air should be figured in an accurate manner, and fans of suitable size with ducts and vents properly located should be provided to insure clean, wholesome air at all times. In crowded city locations this often entails considerable expense, but without it any kitchen is a failure. Natural ventilation is fine, but every kitchen requires some assistance to remove the heat and fumes as fast as they are created. This is a case where the architect and the ventilating engineer must collaborate to bring about the desired conditions.

All buildings should be planned with allowance for a highly efficient ventilating plant with an ample intake and a proper exhaust for basement and first floor area. If these two are not properly provided for restaurant cooking odors will find their way into other parts of the premises, a condition which can be avoided.

It is to the advantage of the other building tenants as well as the restaurant space to have this properly cared for. All air should



Restaurant at 1447 Broadway, New York, illustrating the replacing of ordinary ceiling outlets by new type reflectors.



SAVARIN RESTAURANT, N. Y. LIFE INSURANCE CO.

A. P. JASPERSON, RESTAURANT CONSULTANT

Flush lighting in ceiling over cafeteria counter.

move in the direction of the counter and kitchen to avoid odors in restaurant.

The entire range and broiler section, including the steam kettles and steamers in the rear, should be located under a special hood with carefully graduated openings in a perfectly balanced ventilating system to insure a uniform change of air at all points and to remove food odors. This is necessary because otherwise the intense heat of the ranges becomes unbearable, and it is impossible to keep people working in front of them. This canopy should be fitted with gutters pitching to one point where a pipe takes away the condensation. It also should be fitted with abundant lights which serve the double purpose of assisting the cooks in their work and calling attention to any collection of dirt so plainly that it will be removed before it can fall into the food.

Cleaning, Sanitation and Maintenance of Floors, Walls and Ceilings. The flooring most generally desirable is of red quarry tile separated by ¾" binder strips. Floors should be pitched with frequent drains. Equipment legs must be planned to take care of different levels due to pitch of floor.

Drainage for a kitchen should be given careful attention. The entire system should be run through a grease trap before entering the main sewer, and individual water-cooled grease traps should be provided for the dishwashing machines and pot sinks. Particular attention should be paid to the water from the vegetable peelers on account of the large amount of sediment from this machine. The strainer usually provided with the equipment will remove a large portion of the coarser peelings, but this drain should have a short run and should be given a very good pitch until it reaches the main sewer where there will be sufficient flow at all times to keep it from clogging.

Tile or white enamel brick walls are best, with painted hard plaster a second choice. However, these are not practical in small passages and corridors where service trucks are used. These wainscots should be surfaced with painted heavy gauge galvanized iron

or Monel metal. All exposed corners should be bound with strips of heavy metal for protection and there should be a cove base of tile or terrazzo, with rounded corners, as an aid in sanitation.

A ceiling height of 18′ is recommended but as low as 14′ is practical. Lower ceilings are less desirable since they cause various complications. It is often advisable in large kitchens to cover the walls and ceiling with sound-deadening material because discordant noises make for confusion, increase breakage, and in general cut down the efficiency of the employees.

Provisions for cooking and preparation of food are only a small part of the problem of a properly designed kitchen and work area. Detailed attention must be given to the problems of (1) receiving, storage and routing of food and supplies; (2) refrigeration; (3) cooking and preparation of food; (4) provision for employees.

Receiving, Storage and Routing of Food and Supplies. In the arrangement of the work area the first consideration must be given to the receiving room which must be located convenient to the receiving platform and to the store room and storage refrigerator, or in smaller restaurants, to the kitchen.

For larger types of restaurants doors to the receiving rooms and corridors leading to the store room should be wide enough for two trucks to pass. Wherever the goods are to be weighed there should be room to sort and inspect at leisure. There must be room for large tables, a platform, counter, and hanging scale, and rooms for trucks to load easily.

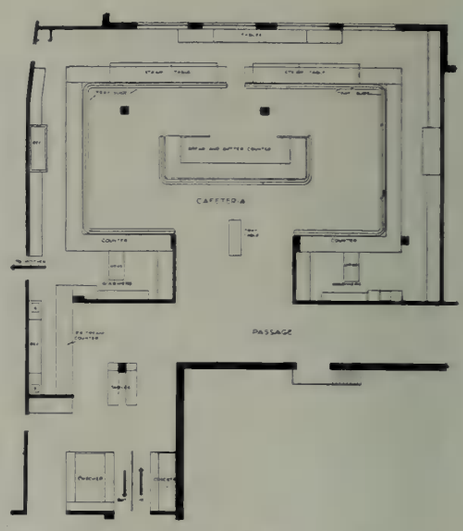
If the store room is on a floor lower than the street, it will be necessary to have elevators, chutes or a conveyor to bring the merchandise into the most convenient part of the receiving room.

Facilities for storage of china, silver, glassware, linens, cleaning supplies and similar materials must be provided in addition to the food storage.

Refrigeration. In general there are three classes of cold storage. In the larger restaurants there is generally what may be called "dead" or "long time" storage for meats or other products bought in quantities. There are also the kitchen or live storage refrigerators and then there are the service or counter cold tables and refrigerators for keeping food cold while waiting service. In soda fountain lunch rooms and restaurants of the smaller types there will be probably only the one refrigerator which will serve for both live storage and service refrigerator, although there is an increasing tendency in some of the dairy lunch rooms to have a refrigerated service counter for keeping salads fresh and cold.

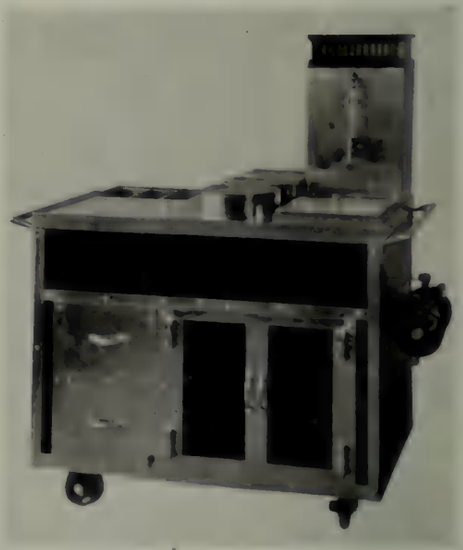
The size of storage refrigerators will be governed by the location and the facilities for speedy and frequent deliveries. They can scarcely be too large. Even though economy must be practiced, good practice should never permit a slighting of quality, as this will invariably prove expensive in the long run.

If the restaurant proprietor owns the building or has a long term lease, cork-and-cement construction may be used for large cold storage rooms. The most common construction is the sectional wood refrigerator which can be taken down and put up again if the occasion requires. If this is used, the walls should be at least 6″ in thickness and consist of two thicknesses of lumber, four thicknesses of insulating paper and 4″ of corkboard. Spruce forms the best lumber for interiors, except for the floor which should be of oak. Ash or oak, painted or varnished, are generally used for exteriors. The boxes are usually lined with galvanized steel.



Plan by Duparquet, Huot and Moneuse Co.

Hollow-square cafeteria counter which speeds self-service.



Unit developed for amusement park service which may be used as a supplementary serving unit in large dining rooms. Designed by Albert Pick-Barth Co.

According to the size of the place, two or more service boxes should be conveniently placed in the kitchen. These boxes range from 4′ to many feet in length and have service doors opening directly to the shelves. There should be as many boxes as there are separate departments in the kitchen. It is unwise to let the chef, baker and pantry man try to operate from the same refrigerator. These boxes, to avoid clumsiness, are sometimes made with thinner walls but they should never be reduced to less than 4″.

Very little consideration is given today to refrigeration by means of ice, as it is far more economical and vastly more clean to use artificial refrigeration. Ammonia and carbon dioxide and sulphur dioxide plants are all common and each has its advantages.

Service Counter Refrigerators: Refrigerating china for ice cream, salads, etc., chipped ice for cold drinks, etc.

Cooking and Preparation of Food. Consideration should be given to having these supplies move forward to the various departments for preparation. There are five major divisions to food and service preparation: (1) range and broiler section, vegetable and soup cooking, vegetable preparation, butcher shop and scullery; (2) cold service and preparation divisions for salad, fruits, sea foods, ice cream and beverages; (3) bakeshop, ice cream making, candy making and similar preparation department; (4) dish washing; (5) live storage facilities, (pantry).

For larger restaurants the general scheme is to group the units with which waiters come in contact into a sort of hollow rectangle, all facing toward the inside. Within this hollow rectangle the waiters circulate. Outside of it the various preparations are arranged, each one if possible directly behind or near the section from which its products are served. Provision should be made on the outside of this larger rectangle for the efficient inter-departmental transfer and checking of supplies.

Cooking in the lunch room presents a very considerable divergence of opinion. The client will probably have very definite ideas on the subject. But it may be said that cooking should never be undertaken in the lunch room unless there is ample provision for mechanical ventilation. Featuring the cooking of some specialty such as spaghetti, buttercakes, griddle cakes, waffles, etc., has often been very successful commercially.

Kitchens for dairy lunches are usually very small owing to the fact that these lunch rooms are generally operated by chain systems which have central commissaries for baking, roasting and other heavy operations. At times the kitchen is designed like a grille, the short order equipment being set along the wall behind the service counter and ventilated by a high grade canopy. In all cases, the dishwashing is located in an enclosed space or in the basement.

The cafeteria kitchen, unlike that of the ordinary restaurant, should be entirely open with each department under the eye of the chef. There should be no service pantries for salads, cold meats or pastries as the dining room counters take the place of these in cafeteria operation. On the other hand, ample table space for salad and cold meat preparation, as well as large work tables for the chefs and for bread and pastry cutting, are essential. The partition separating the kitchen from the dining room should be provided with service slides at proper intervals. The use of basement space for the dishwashing, pantry, store rooms, storage refrigerators, and refrigeration machinery, vegetable rooms, help's quarters, etc., is very often



Dishwasher



Drucker & Boltes Co.

Kitchen Equipment

an aid to operation, and a means of conserving valuable main floor space. Aside from these special features, the cafeteria kitchen requires the same general equipment as is necessary in any other kitchen.

Disposal of Garbage. For the larger restaurant a holdover room with its temperature lowered from a connection made with the refrigerating system, and ventilated, is considered the best method. This permits a collection at convenient periods.

Cleaning, Handling, and Storage of Dishes. The sooner bus boys or waiters can deposit soiled dishes, the less the costs of handling. For this reason the place for receiving soiled dishes, whether it be window into dishwashing department or conveyor or subveyor, should be located as close as possible to the dining room and yet be properly sound insulated from the dining room and have efficient contact with the kitchen. Noise, steam and odors from this department must be kept out of the dining room and if possible out of the kitchen also.

The dishwashing and silver-washing departments must be compact without being crowded. A crowded condition makes for greater breakage and more noise. Ample space must be provided for the storage of dishes after they are washed and this storage space should be located conveniently for the routing of the dishes to the kitchen without crossing the incoming route. Provision should also be made for the proper cooling or heating of dishes for hot or cold foods.

MECHANICAL EQUIPMENT

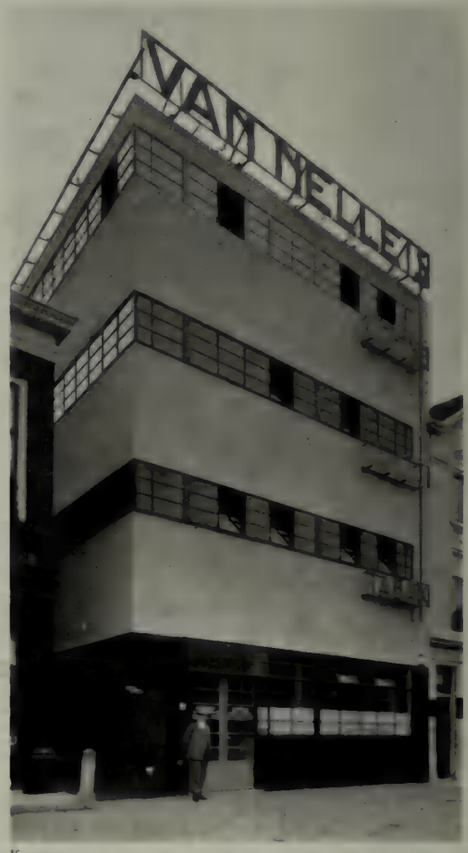
Cost Efficiency of Fuel and Power. The three fuels found to be most satisfactory are gas, steam and, at times, electricity. Coal ranges are fast going out of use as gas has practically supplanted coal as the most popular fuel.

Steam. Where steam is available, it should be used for heating urns, steam tables, warmers, kettles, meat roasters, steam cookers, raising temperature of water used for glass and dishwashing, etc. It is a more economical fuel than gas and is cleaner, less bothersome, saves space and is more generally satisfactory in every way. So valuable an asset is steam that it is often provided by a separate boiler for this purpose, operated either by coal or gas.

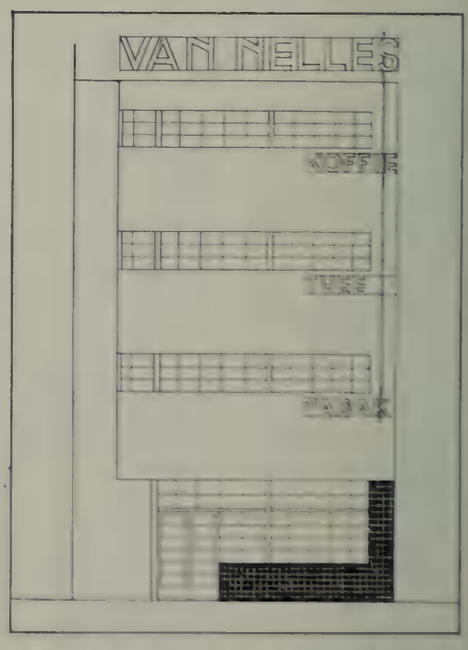
Oil. Some sections of the country have found oil practical for fuel, especially where crude oil may be obtained at a very few cents a gallon. This should be approached with caution, however, as it involves the use of special mechanical equipment, the reliability of which varies with different makes.

Electricity. With the development of large power stations throughout the country, electricity is coming more and more into demand for ranges, broilers, urns, steam tables, etc. (It is, of course, widely used for specialty devices.) For the cost of operation to compare favorably with gas it is necessary that the current cost be not over 2 cents per kilowatt as compared with gas at $1 per 1,000 cu. ft. Such power rates are frequently offered by the large companies in the principal cities to induce customers to install this type.

Hot Water Supply. The absence of an adequate hot water supply has caused more dissastisfaction with dishwashing and other cleaning machines than any other one factor, and whereas a larger boiler requires a little additional expense at the start, it is money well spent in the end.



Kamman



COFFEE SHOP AT SCHIEDAM, HOLLAND

J. A. BRINKMAN and L. C. van der VLUGT, Architects.

CHECKING LIST OF RESTAURANT REQUIREMENTS*

EXTERIOR
- Materials: (front, rear, sides, courts, penthouses).
- Walls:
- Roof:
- Windows: no restaurant windows except street walls.
- Doors: restaurant entrance doors to be revolving or auto-balance.
- Skylights:
- Special: restrict extent of tenants' signs and awnings when part of building is sublet to tenants other than restaurant operator.
- Color: (indicate).

ENTRANCES (Revolving Doors)
- Type:
- Dimensions: 7′ 0″ wide; 7′ 0″ high; secondary revolving door, if any, 6′ 0″ diameter.
- Finish:
 - Floor—terrazzo; 1½″ thick; divided into 18″ diameter center, and field quartered at 45.
 - Border—terrazzo; 1½″ thick; 9″ wide; quartered on axis.
 - Kickplates—bronze plates up to panel mold, on both sides of enclosure and on both sides of doors; hardware applied on plates.
 - Enclosure—bronze, plate glass.
 - Doors—Class A—bronze Kalamein; Class B—straight-oak; plate glass.
 - Ceiling—
 - Cornice—
 - Roof—
 - Hardware—each leaf 1 push bar; with plain bronze push plate 5″ x 18″ x ⅛″, beveled edge. Manufacturers standard top bolts, with cylinder locks on 2 leaves. Time lock.
 - Color: (indicate).
 - Electric lights—recessed in ceiling.

ENTRANCES (vestibules and emergency doors)
- Gate: folding gate in niche.
- Dimensions: emergency exit (for revolving door) —min. 3′ 0″. Slight step at bldg. line preferred with rev. door—pref. 2″, max. 6″.
- Finish:
 - Floor—alundum terrazzo 1½″; pitch to step at building line.
 - Border—
 - Base—
 - Walls—as much glass as practicable.
 - Ceiling—
 - Doors—swinging outwards, or D.A.; class A—bronze, aluminum, or other metals; B—white oak or wood selected.
 - Electric lights—recessed in ceiling.

ENTRANCES
(Show Cases)
- Contents:
- Dimensions: top of glass not over 5′ 0″ above sidewalk.
- Finish:
 - Floor—marble ⅞″ thick; polished.
 - Walls—mirrors, waterproof felt-backed.
 - Ceiling—acid etched glass.
 - Shelves—plate glass, bottom shelf not over 24″; supports n.p. brass stanchions with adjustable brackets.
 - Access door—preferably from inside-cylinder lock.
 - Ventilation—sliding ventilator at top and bottom.
 - Electric—3 elec. lights in ceiling above glass.

(Marquise)
- Dimensions: Roof to pitch to bldg. line. Lowest point not less than 10′ above sidewalk.
- Finish:
 - Signs—on 3 faces, illuminated; ventilate lamp boxes and reflectors to prevent cracking of signs.
- Mechanical:
 - Plumbing—leader connection.
 - Electric—provide outlet for 3 signs illuminated; access to lamps.

ENTRANCE: (basement stair)
- Dimensions:
 - Minimum at 1st floor—10′ wide.
 - Doors—5′ x 7′, double acting, set back 3′ 0″.
- Finish:
 - Risers—marble.
 - Strings—marble.
 - Treads—precast alundum terrazzo, 1½″ thick, ½″ bed, pitch ⅛″; 6′ 0″ limit single width; stagger joints.
 - Platforms—precast alundum terrazzo.
 - Street landing—terrazzo.
 - Bottom landing—same as dining space.
 - Sign over stair—bronze frame.
- Mechanical:
 - Electrical—outlet for sign over stair; separate circuit.

CASHIER'S BOOTH (Stationary)
- Contents:
 - Cashier's seats—two.
 - Safe—1′ 11″ x 1′ 9″ x 2′ 4½″ high; anchor to floor.
 - Heater—electric.
 - Oscillating fan.
 - Reflector.

*Excerpts from list developed by F. P. Platt and Bro., architects.

Manager's call bell.
Telephone.
Finish:
Floor and Border—same as dining space.
Base—exterior white oak, bronze plate 7½" high; interior oak.
Wainscot—quartered white oak; 3-ply stiles and rails; 5-ply panels with grain horizontal; steel bracing.
Counter—marble; bronze flap over safe.
Super-structure—white oak uprights and cornice; plate glass panels; speak hole; bronze edge to curved opening; bronze brackets.
Ceiling—polished wire glass; sliding panels; sunken finger grips.
Cash drawers—2; monel metal lining with bill guards; drawer rest for open position.
Door—quartered oak; upper panel plate glass; bronze kickplate on outside.
Hardware—doors are to be fitted with spring latches controlled by knobs or handles from both sides and without stop work that would permit the latch to act as a dead bolt; in addition a dead bolt with a thumb turn on the inside is to be provided.
Color: (indicate).
Mechanical:
Electric—base receptacle for heater; wall receptacles for fan and reflector, wire for reflector in trough in cornice; conduit for telephone; wire call bell.

DINING SPACE
Contents:
Electric clock—discuss location with owner on each job; "Telechron" built flush with wall, numerals attached to wall, black metal hands; connected on separate circuit to A.C. light current; 19" diam. dial; hands stock design.
Cafeteria guard rail—monel metal, 2½" diam. 3' 0" high, 5' 0" min. from tray rail; posts 2½".
Tray rail—
Subveyor—or soiled dish opening.
Checker stand—
"No smoking" and other signs—
Umbrella stands—
Tables, chairs, etc.—
Silver, tray and napkin stands, metal counter stands.
Telephones—
Cashiers' booths—stationary; portable—approx. 6' x 4'—no connections.
Dimensions:
Live load 120#.
Minimum clear height at counter from under mezz. 7' 6".
Where columns occur in front of counters keep clear 6' 6" aisle.
Finish:
Floor—terrazzo; 1½" thick; polished; 16" sqs. set diagonally.
Border—terrazzo; 1½" thick; polished; 8" wide; no design.
Base—terrazzo; 1½" high; 1" radius cove.
Wainscot—marble; 4' 9" high; painted wipe band.
Cap—marble; molded, 3" high.
Main wall surfaces—plaster, painted.
Cornices—hard white plaster, painted.
Ceiling—sound absorptive material.
Fan blocks—white oak; painted or stained finish, 10" diam.; bottom 7' 0" from floor.
Color—
Mechanical:
Electric—each ceiling outlet on separate circuit; use minimum number of lamps per fixture; check location of mezzanine sign outlet with owner.
Oscillating fans.
Cashiers' Booth connections.

MEZZANINE DINING SPACE
Contents:
Rinsing sink—question owner.
Service closet.
Drinking fountain—number of faucets.
Cooling unit—located near fountain.
Subveyor—wood access doors.
Tables, chairs, umbrella stands.
Dimensions:
Floor load—100#.
Width of mezzanine—min. 10' 6" for one 4-seat and one 2-seat table. Always set 4-seat tables at railing, place diagonally.
Finish:
Floor—terrazzo, 1½" thick; polished; 16" sqs. set diagonally.
Borders—terrazzo; 1½" thick; polished; 8" wide.
Base—terrazzo; 6" high; polished; 1" radius cove.
Wainscot—same as main wall surfaces.
Chair rail—straight white oak; 2¼" x 1⅛"; top of ch. rail 2' 8" above floor.
Main wall surface—see first floor.
Cornice—see first floor.
Ceiling—see first floor.
Windows—casement; oak; amber glass; oak trim; silver gray green.
Fan blocks—see first floor.
Color—
Mechanical: see first floor.

WATER BOOTH
Contents:
Glass washing sink.
Glass washing machine.

Fountain tray.
Glass rack.
Wringer sink.
Water cooler.
Dimensions:
Finish:
Floor—2″ hex. tile, white.
Border—none.
Base—white glazed tile 6″; exterior same as dining space.
Wainscot—interior tile, 5′ 6″ above base; white, glazed, 3 x 6″; exterior same as dining space; walls exposed to public view to have marble wainscot.
Cap—interior tile.
Walls—hard white plaster.
Ceiling—hard white plaster.
Doors—none.
Mechanical:
Plumbing—no floor drain required except where glass washer is used.
Ventilating: no grilles, no vent required.

PUBLIC STAIRS
Contents:
Electric sign.
Dimensions:
Finish:
Risers—class A, marble, ⅞″ thick, polished; allow for liners if botticino; class B—steel.
Strings—same as risers.
Treads—precast alundum terrazzo, 1½″ thick; ½″ bed; additional tread at top.
Landings—precast alundum terrazzo, 1½″ thick, ½″ bed; stagger joints.
Rail—wrought iron, extruded bronze; center if width more than 7′ 4″.
Curb—same height and material as base around all stair wells.
Enclosure—only if required by law.

MEN PATRON'S TOILET ROOM
Contents:
Liquid soap dispensers and tank.
Toilet paper holders, mirrors, towel holders.
Towel basket.
W.C.'s.
Urinals.
Lavatories.
Dimensions:
Finish:
Floor—¾″ sq. black and white tile; 9T sq. black and 9T sq. white; pitch to urinals.
Border—3 rows of 1″ sq. black tile.
Base—black ceramic 4″ high, tile.
Wainscot—tile; 5′ 6″ above base; white glazed; 3 x 6″ (build in owner's sign).
Cap—tile.
Walls—hard white plaster; enameled.
Ceiling—hard white plaster, furred to cover ducts; enameled; hung ceiling 8′ 0″ from floor.
Partitions—between lavatory and toilet, same as walls.
Compartments—steel; no doors if shielded location; stand open and swing in if used; partitions, black glass.
Doors—bronze louvres in entrance door; no locks or latches.
Mechanical:
Ventilating—grille between lavatory and toilet. Grilles to ducts on ceiling where conditions permit.

WOMEN PATRON'S TOILET
Contents: same as Men Patrons' Toilet.

STORAGE CLOSET
Location: under stairs.
Contents: shelves as space permits.
Size:
Finish:
Floor—cement.
Base—cement 6″ high; coved around top.
Walls—cement plaster painted.
Ceiling—furred if space is too high or irregular in shape; hard white plaster if furred and painted.
Electrical: ceiling light.

DELIVERY ENTRANCE
Contents:
Stair to work space.
Dimensions:
Finish:
Floor—paving brick; 1¾″.
Base—red cement, 6″ high.
Wainscot—steel facing, or brick or concrete with protection L's at all exposed corners.
Walls—brick, concrete, or white plaster; painted.
Ceiling—concrete slab or white plaster; painted.
Doors—entrance doors wood, bronze protection plates inside, steel inside; no handles on outside of door; cylinder dead bolt with thumb turn inside; glass panels.
Mechanical:
Plumbing—sill cock, near entrance; drain valve in basement.

CAFETERIA COUNTER
Contents:
Menu boards—bronze frame.
Tray slide—brackets and bolts.
Steam table.
Cold pans.
Reflector hoods.
Ice cream cabinets.
Door.

Dimensions:
When no "T" uprights, wainscot secured to steam table framing.
Finish:
Base—exterior terrazzo, 1½" high, 1" alcove; interior, 6" high tile base.
Wainscot—exterior marble, ⅞"; interior unfinished.
Counter—monel metal, including edging.
Walls—exterior same as dining space; interior, smooth cement plaster except back of marble wainscot; where exposed to public view, tile or metal wainscot.
Cornice—exterior, same as dining space.
Doors—D.A., quartered oak; no saddle unless floor material changes; high bronze protection plate with moldings 2 sides.
Painting—exterior, see dining space; interior, wood and metal.
Mechanical:
Ventilating—
Electric: hood lights: twin outlets, 18" to 24" o.c., alternate circuits, pull chain, arranged symmetrically with glass panels; outlets in ceiling space 32" o.c.

SERVICE SPACE
Contents:
Refrigerator.
Dumbwaiter.
Wagon pan racks.
Urn table.
Work tables.
Sinks.
Bread slicing table.
Sandwich table.
Meat-cutting table.
Glass rack.
Heater.
Cup storage.
Pie racks.
Finish:
Floor—4" x 4" tile; only slight pitch to drains.
Base—tile.
Walls—smooth cement finish.
Ceiling—finish only in special cases; then smooth cement plaster.
Dumbwaiter enclosure—6" white glazed tile, base 10" gauge steel enclosure.
Painting—steel and iron enameled white.
Mechanical:
Ventilating—hood as large as possible to hold excess smoke and gas.

SERVICE STAIRS
Contents:
Dimensions:
Wherever possible make stairs 44" wide, without winders.
Finish:
Risers—steel stair construction.
Strings—sheet steel.
Treads—steel base, lead filled nosing, 4 grooves wide, applied to front of sheet steel tread, extending to 3" of strings; landings entirely covered, 6" sections.
Rail—pipe rail at stair and around well.
Curb—red cement 6" high.
Enclosure—omit if possible.
Walls—smooth cement plaster except where exposed to public view; in which case, tile.

RECEIVING SPACE
Contents:
Space for goods received before distribution; and for temporary storage of outgoing garbage, where no garbage room is provided.
Dimensions:
Finish:
Floor—paving brick, 1¾".
Border—none.
Base—cement, 6" x ¾", coved, beveled top.
Walls—smooth cement plaster; protection angles at exposed corners.
Ceiling—smooth cement plaster.
Mechanical:

GARBAGE ROOM
Remarks: only provided where excess amount of garbage is expected.
Contents:
Refrigerating coils.
Dimensions:
Finish:
Mechanical:

SIDEWALK ELEVATOR
Type: spur gear, manually operated from floor level; slack chain devices.
Contents:
Platform.
Machine.
Dimensions:
Platform—3' 3" x 4' 6" except where good reason for changing; access to both sides where possible.
Load capacity—1,500 lbs. approx.
Finish:
Sidewalk doors—light weight account manual operations, checkered steel plates.
Enclosure—wire mesh.
Gate—automatic, wood slat gate, sliding vertically.
Platform—wood.
Curb—steel angle at bottom landing.
Drain—gutter at sidewalk doors, leading to drain pit.
Bell—warning signal and signs.

STORE ROOM
Contents:
Racks.
Electrical equipment.
Testing lamp.
Dimensions:
Finish:
Floor—paving brick, 1¾″ thick.
Border—none.
Base—red cement, 6″ high, coved, ¾″ thick, beveled top at walls.
Wall surface—smooth cement plaster; painted.
Enclosure—2½″ sq. tubular posts; filler pieces held in with small continuous stops; bottom sections, steel plates; top sections, wire mesh.
Door (sliding)—entirely of wire mesh with no provision for wicket; counter flap to fold across opening during day time; Vitritile walls to be used where equipment is placed against store room walls.
Ceiling—smooth cement plaster, except where story height is excessive, then use wire mesh.
Mechanical:
Electric—wall receptacles for equipment.

MAIN REFRIGERATOR
Contents:
Food compartment.
Ice compartment.
Coils.
Ice crusher—with super-service cord and Kliegel plug.
Dimensions:
Finish:
Sub-floor—concrete, 6″ below floor level; waterproof if above occupied space.
Base—exterior, red cement 6″ high, square top, continuous under doors.
Finish—all other exterior finish, construction and all interior finish by box manufacturer.
Coils—refrigeration machine contractor.
Mechanical:
Electric—vapor-proof lighting fixtures; provide outlet for ice crusher in front wall of refrigerator; starting box and switch.

REFRIGERATION MACHINE ROOM
Remarks: ammonia mixing box in street.
Contents:
Motor.
Compressor.
Tank—provide foundation and supports for above when required.
Dimensions:
Locate as close to the main refrigerator as possible.
Provide space for pulling condenser tubes.
Door width to accommodate largest machine.
Finish:
Floor—cement 1″ smooth.
Base.
Walls.
Ceiling.
Door—steel faced; no louvres or glass panels; air-tight and always swing out.
Mechanical:
Ventilating—independent, direct positive exhaust to outer air.

KITCHEN
Contents:
Bain-Marie, hot.
Sink.
Griddle table waffle iron.
Roast oven.
Dumbwaiter.
Steam table.
Bread table.
Meat slicer.
Work table.
Glass rack.
Fan controller.
Potato peeler.
Dimensions:
Preferred clearance in passages 5′ 0″; never less than 4′ 6″.
Finish:
Floor—paving brick, 1¾″ thick.
Border—none.
Base—red cement, 6″ high, coved, ¾″ thick, beveled top.
Walls—smooth cement plaster; use Vitritile back of kitchen griddle where possible or Vitritile furring.
Dumbwaiter enclosure—steel sheets.
Partitions—metal lath and smooth cement plaster; doubled where pipes occur.
Ceiling—smooth cement plaster.
Mechanical:
Ventilating—hood as large as possible to hold excess smoke and gas; use copper hood when covering equipment exhausting steam; where no steam use Toncan metal.

DISHWASHING SPACE
Contents:
Subveyor.
Washer.
Garbage receptacle.
Silver burnisher machine.
Silver drying table.
Silver washer.
Clean and soiled dish tables.
Heavy duty sink.
Tray sink optional.
Soak sink.

Dumbwaiter.
Work table.
Dimensions:
Finish:
Floor—paving brick, $1\frac{3}{4}$" thick.
Border—none.
Base—red cement, 6" x $\frac{3}{4}$", coved, beveled top.
Walls—smooth red plaster.
Partitions—metal lath and smooth cement plaster, 2" thick; doubled where pipes occur.
Ceiling—smooth plaster.
Subwevor enclosure—steel sheets.
Mechanical:
Ventilating—large size hood over dishwasher.
Plumbing—floor drains.

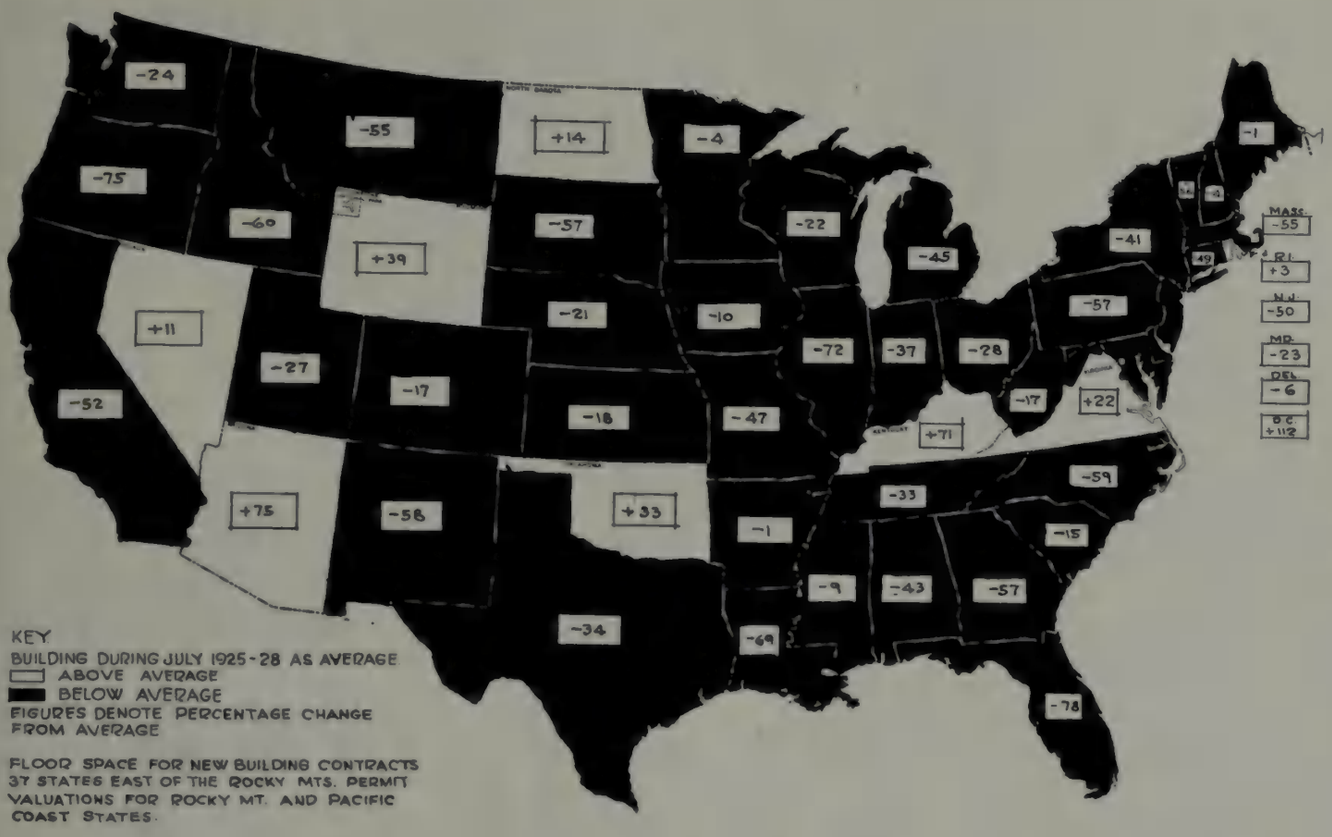
HELP'S DINING SPACE
Contents:
Tables.
Benches.
Dimensions:
Finish:
Floor—paving brick, $1\frac{3}{4}$" thick.
Border—none.
Base—red cement, 6" high, coved, $\frac{3}{4}$" thick, beveled top.
Walls—smooth cement plaster.
Ceiling—smooth cement plaster.
Mechanical:

FEMALE HELP'S LOCKER ROOM
Contents:
Lockers.
Cot—provide space.
Dimensions:
Aisle between double row lockers 5' 0"; single row 3' 0"; maintain a minimum clear height of 7' 0" under all pipes and ducts.
Finish:
Floor—1" white hexagonal ceramic tile (avoid raised saddles).
Border—none.
Base—6" white glazed tile.
Walls—smooth cement plaster.
Partitions—smooth cement plaster.
Ceilings—smooth cement plaster.
Door—hard wood, self-closing, no lock; raised 1" from floor, louvre panel, and grille above if necessary to equal exhaust area, steel channel frame, no trim.
Color—walls and ceilings painted; battleship gray dado, and white; doors and frames painted green.
Mechanical:
Ventilating—on toilet system independent of restaurant.

FEMALE HELP'S TOILET ROOM
Remarks: access not to be through locker rooms.
Contents:
W.C.'s.
Lavatories.
Liquid soap.
Dimensions:
Finish:
Floor—1" white hexagonal tile.
Steps—risers, treads, cheeks of paving brick; pipe railing.
Border—none.
Base—white glazed tile.
Wainscot—$\frac{1}{2}$" x 6" white glazed tile, 5' 6" high.
Walls—smooth cement plaster, painted.
Partitions—cement plaster, fixtures so arranged that a partition forming a vestibule can be installed in the future.
Compartments—steel, doors to stand open and swing in except where such arrangement causes waste of floor space.
Ceiling—smooth cement plaster.
Door—hard wood, self-closing, no locks, raised 1" from floor, louvre panel, and grille above if necessary to equal exhaust area, steel channel frame, no trim.
Color—door and base red; walls and ceilings painted; battleship gray dado, and white; doors and frames painted green.
Mechanical:
Ventilating—toilet system independent of restaurant; ducts to be arranged so that a branch installation can be extended to future vestibule.

MALE HELP'S LOCKER ROOM
Contents: same as Female Help's Locker Room, except no cot.

MALE HELP'S TOILET ROOM
Remarks: access not to be through locker room.
Contents: same as Female Help's Toilet Room.



Gain in number of states showing improvement is largely offset by declines in actual volumes. Figures are based on building reports for July, 1930.

BUILDING TRENDS AND OUTLOOK

PROSPECTS FOR RESIDENTIAL CONSTRUCTION

It is residential building that holds the key to revival in the construction industry and through it recovery in general business. This is increasingly apparent from the record for the first seven months of 1930 as compared with the same period of 1929 because of the inability of a gain in new engineering work of 20 per cent to do more than feebly offset the effects of a declining building trend.

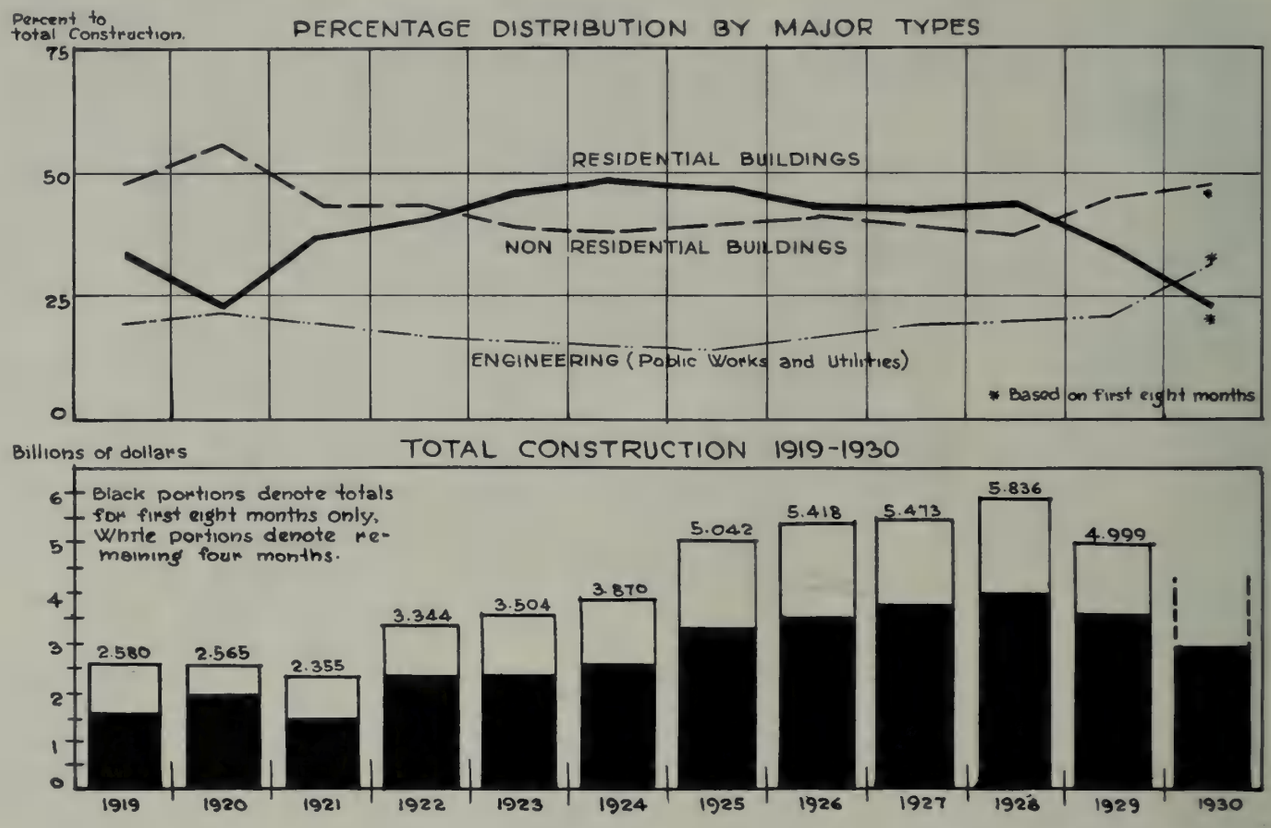
The large activity in the construction industry during the years following the depression of 1920–21 found its principal impetus in residential building. It will be recalled that this branch of the industry was retarded during the war years because of the urgent demands of industrial mobilization. And it was here that Rent Commissions throughout the most populous sections of the country, in their endeavors to prevent rental profiteering, artificially prolonged the period of housing shortages. On retrospect, capital could hardly have been expected to flow freely into new residential building with restrictions as to investment returns virtually dictated by the Commissions. Especially was this the case in 1920 and 1921 when funds invested in more liquid securities were on a relatively high yield basis and the purchasing power of the dollar thus derived from interest and dividends had measurably recovered from its low in the spring of 1920.

It is presumptuous to say what might have happened if fears of profiteering had not necessitated reprisals in the form taken. Though there doubtless would have been many evidences of temporary hardship to the wage-earner it would appear rather certain that free flow of capital for residential building would have enlarged the supply of housing in quicker satisfaction of the accumulated deficiency. Interruption in the untramelled operation of supply and demand, once the pegging influence of Rent Commissions was removed, brought forward a large number of small inexperienced builders and less responsible speculators whose products for the most part were those of the marginal producer so well known in the industrial world and which incidentally had no small part in the overproduction of housing from which we are now slowly recovering.

Fortunately the recession in building and business generally has in a large degree eliminated these

CONSTRUCTION CONTRACTS AWARDED IN 27 NORTHEASTERN STATES

1919—1930



factors, but not without large cost to business prosperity. For each of the years from 1922 to 1928, inclusive, residential building accounted for 40 per cent or more of the total new construction volume reported, reaching the maximum ratio of 48 per cent in 1924 and its largest dollar total in 1928, with a ratio to total of almost 44 per cent. On a dollar total twice as large as in 1921 the 1929 volume of residential building showed a ratio lower than in 1921; the 1929 ratio of 35 compared with 37 for 1921.

Based upon data for the first eight months it is likely that 1930, in dollar volume, will fall between the 1922 and 1923 residential total, the fulfillment of which would require a rather sizeable recovery in the closing months of the current year since we are now running measurably behind 1922. Relatively, residential building for 1930 thus far, with a ratio to total construction volume of about 22 per cent, is where it was in the depression year 1920, though the actual total for the eight months of 1930 was sizeably larger than that reported for the entire year 1920.

The July building map, based upon floor space of new building contracts, showed nine states (inclusive of the District of Columbia) where current volume was greater than is average for the month (July 1925–1928 inclusive taken as average): Rhode Island, District of Columbia, Virginia, Kentucky, North Dakota, Oklahoma, Wyoming, Arizona, and Nevada. Though the June map showed only six states, Vermont, Connecticut, Virginia, North and South Dakota, and Nebraska better than average, the spottiness of the current situation is emphasized by the fact that in July only Virginia and North Dakota were able to maintain the gains in current new activity evidenced in June. The effect of the gain in July in the number of states showing better than average was measurably offset by declines in actual volume in those states which failed to carry through their June gains.

The July dollar volume of new building, apart from engineering, undertaken in the 37 states east of the Rocky Mountains totaled $252,662,100. This was a decrease of almost 28 per cent from the preceding month and 45 per cent from the abnormally large record for July, 1929. New engineering work contracted for in this territory, amounting to $114,866,300, brought the July construction record to $367,528,400. This was a decline of 39 and 44 per cent, respectively, from the totals reported for the previous month and July 1929.

The volume of new building undertaken during the first seven months of 1930 totaled $2,041,937,000,

(Continued on page 94, advertising section.)



"MONTICELLO"



Its radiant whiteness is due to a new development in EXTERIOR PAINTS

THE paint that has so signally enhanced the charm of Monticello is Outside Barreled Sunlight. In this, a totally different kind of exterior paint, there is achieved a notable purity of tone, a delightful smoothness of texture.

Nor have more practical qualities been slighted. Outside Barreled Sunlight works well; it is durable; it wears away so evenly the surface is in good condition when repainting becomes desirable.



For an interesting new booklet, mail the coupon.

U. S. Gutta Percha Paint Co., 22-I Dudley St., Providence, Rhode Island. Branches or distributors in all principal cities. (Distributors for Pacific Coast, W. P. Fuller & Co.)

OUTSIDE BARRELED SUNLIGHT

Reg. U. S. Pat. Off.

U. S. Gutta Percha Paint Co.
22-I Dudley Street, Providence, R. I.

Please send me your booklet, "The Whitest White House in Town."

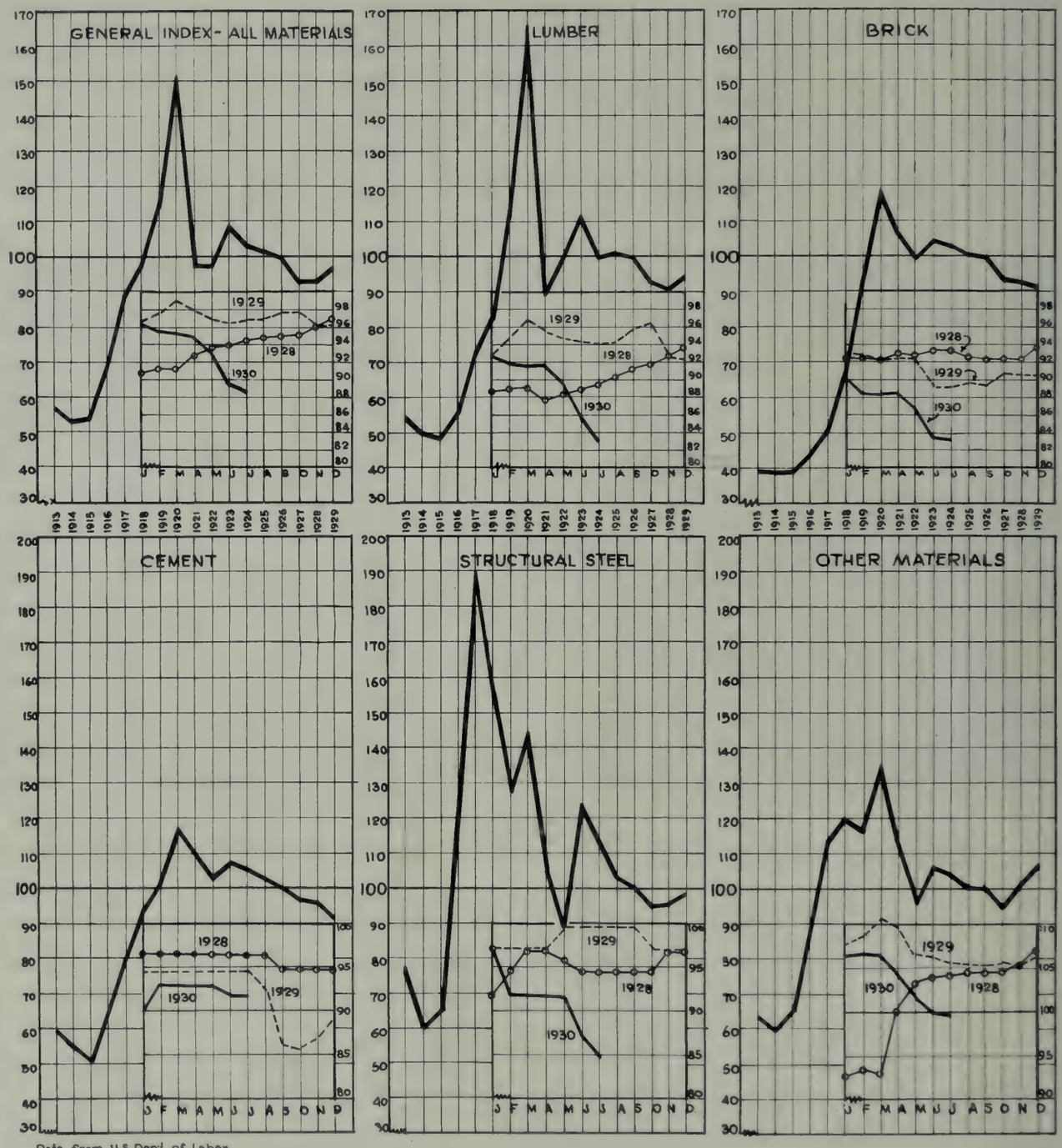
Name_____

Street_____

City_____ State_____

WHOLESALE PRICES FOR BUILDING MATERIALS

(1926 monthly average = 100)



Data from U.S. Dept of Labor

For the seven-year period from the beginning of 1913 to the beginning of 1920 the general index of building material prices was substantially lower than the general index of commodity prices. The largest divergencies in this period occurred during the years 1917 and 1918 when building material prices on the average were 25 per cent lower than the general commodity level reflecting the relative inactivity of building aside from that which was necessary for requirements of war. For the period from 1920 through the middle of 1922 the two movements were in very close agreement; from midyear 1922 through midyear 1924 building material prices were continuously higher than the general index; from that time to the middle of 1927 both moved within the same general range; since then and throughout 1928 building material prices were lower. Through 1929 prices for materials were higher while recent trends show building materials still above the general commodity index.

Architects pay tribute to Andersen . . . on their specification sheets



The Andersen circle trademark is die cut in the sill — a quality guarantee.

Note Andersen mortar clinch grooves to make weather tight union with wall.



Holland House, Forest Hills, Long Island. Equipped with Andersen Masonry Frames.

FROM drafting room to finished job, the new Andersen Master Frame is winning the architect's critical approval.

All parts of genuine white pine; perfect mill workmanship — absolute accuracy, a type and size for your every need; steep sill slope; wide blind stop provisions. These are a few of the reasons why architects today are writing, on their specification sheets, a remarkable tribute to this new Andersen Master Frame. Remember also—Andersen's patented noiseless pulleys are used on every frame.

We will be glad to mail your copy of our new catalog, No. 500. Andersen Frame Corporation, Bayport, Minnesota, represented by 3,500 leading jobbers and dealers.

Andersen MASTER WINDOW and DOOR Andersen FRAMES Frames

FOR WEATHERTIGHT INSTALLATIONS—USE ANDERSEN SPECIFICATIONS

a decline of $823,000,000 from the corresponding period of 1929, of which $623,000,000 was in residential and $200,000,000 in non-residential building. Relatively, the decrease in residential building was likewise much more drastic than in non-residential building, the decline of 48 per cent in the former contrasting with a decrease of only 13 per cent in the latter. Although a gain in engineering amounting to $161,000,000 was registered, total construction for the first seven months, including engineering showed a decrease of 18 per cent from the corresponding period of 1929, the total for the first seven months of 1930 amounting to $3,005,542,000.

Prices for building materials continued to recede in July and in the early weeks in August in sympathy with the general trend in commodity prices. As a matter of interest the general index of building material prices compiled by the U. S. Department of Labor was lower in July than in any month since the autumn of 1917, lower even than prices during the depression of 1920–21. What is more, the persistent decline since October, 1929, has now amounted to 10 per cent, the largest relative decrease in so short a period since that recorded in the last depression from a much higher actual level. This decline in building material prices, aside from other considerations, is most intimately identified with the drastic decrease in new building which has been experienced in the past eighteen months. Materials particularly identified with residential building have quite naturally suffered more than those which find large use in other types of construction, paralleling the more drastic decrease in demand from a weakened condition in the residential field.

It would appear that the liquidation of the oversupply in housing, on a subnormal current new building volume, is nearing the point where better balance between supply and demand may be expected. Coupled with this is the growing interest on the part of architects, engineers, and manufacturers of building materials and equipment in research programs for the reduction of unit costs, particularly as applied to residential building. When liquidation will have run its course is difficult to foresee, but with the arrival of that period residential building should gradually regain its position of first importance and provide the basis for prosperity within the entire construction industry and business generally.

That residential building will be restored to its primary position during 1931 is to be seriously doubted. The difficulty in the present situation is not now so much one of high unit costs nor even of financing, of which much has been made, but rather the lack of balance between supply and demand which is nearing the zero point. This type of building activity in 1931 is quite likely to regain some of the ground lost in the past two years. On entirely different conditions, the relative position of residential building should be more nearly like the year 1919 when this type of construction was about one-third of the total. It would now appear that with known large supplies of money awaiting employment in new building activity and determined efforts at reduction in production costs, the stage is being set for the creation of large housing corporations, vying in size with many of our largest industrials, whose principal business will be the redevelopment of existing centers on a reasonable rental basis. That this can be done may be inferred from the loaning operations of life insurance companies on improved real estate which, until recently, were at a rate in excess of one-half billion dollars a year. These companies, in no small measure, provided a stimulus to building activity during the past few years little short of spectacular. Life companies since the beginning of 1923 have added more than three billion dollars to their mortgage investments on improved realty, both residential and non-residential, principally commercial. That the rate of loaning operations by these companies has been halved in recent months, though reflecting other considerations as well, would seem to indicate a retrenchment dictated by conditions within the building industry itself.

When residential building has been placed upon a firmer footing by the intelligent research now brought into play by numerous agencies, we may expect to see the life companies again active in financing, though perhaps on a different basis. More scientific town-planning is in the offing. The rehabilitation of blighted urban areas is receiving much attention. As these movements gain headway we may see some retardation in the spread of suburban developments in favor of a trend toward reconstruction of run-down areas. In this movement large-scale modern apartment house operations will provide the nearest approach to the mass production principle thus far devised though it is not unlikely that small residential types, where unit costs are materially higher, will also find a more modern adaptation of mass production than has hitherto been provided by party walls.

L. Seth Schnitman.

A $600,000,000 Waste!

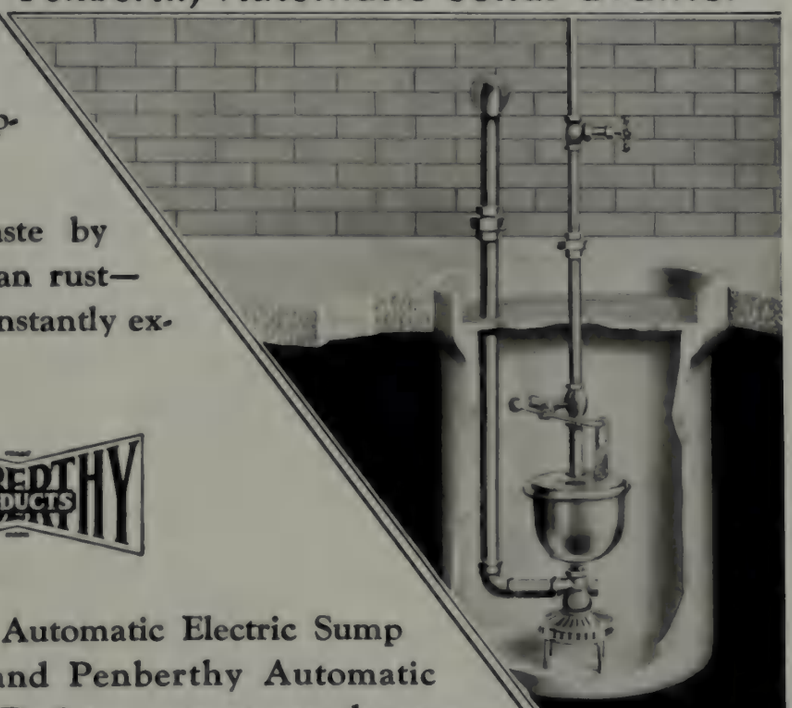
Are you responsible for a part of it?

The annual loss in the United States due to rust is estimated at $600,000,000. This figure is appalling—particularly when you realize that much of the loss is preventable by using equipment made from copper and its alloys.

Do you contribute to this waste by specifying equipment that can rust—for service where it is constantly exposed to dampness?



Penberthy Automatic Electric Sump Pump



Penberthy Automatic Cellar Drainer

PENBERTHY PRODUCTS

Penberthy Automatic Electric Sump Pumps and Penberthy Automatic Cellar Drainers cannot rust, because they are constructed of copper, brass and bronze throughout. Architects who specify them keep their clients' dollars out of the rust pile.

The operation of Penberthy Sump Pumps and Cellar Drainers is thoroughly dependable and economical. There is a size and type for every drainage requirement.

These Penberthy Pumps are quickly available—they are carried in stock by the leading jobbers throughout the country.

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ESTABLISHED IN 1886

DETROIT

CANADIAN PLANT WINDSOR, ONT.

LIGHTING
BY
PEARLMAN

Those who seek the unusual, distinctive and beautiful in Lighting Fixtures quickly recognize the originality, authenticity and artistry of Pearlman design and manufacture. In every Pearlman design there is that knowledge of harmony and balance which compliments and enhances your architectural effort.

A single candle — a single fixture—the lighting of an entire building from bungalow to cathedral — all receive the result of our many years of knowledge, experience and ability.

All of our facilities are available to the architectural profession for research and consultation. Ask us to send you our series of Lighting Studies in plate form as they appear — no obligation of course.

Victor S. Pearlman & Company
DESIGNERS AND MAKERS OF
DISTINCTIVE LIGHTING FIXTURES
533 South Wabash Avenue · CHICAGO

BOOK REVIEWS

PRAESENS *Revue 1930*, Szymon Syrkus, editor, 38–13 Rue Senatorska, Warszawa, Poland; 199 p., 45 francs.

A yearly publication devoted to contemporary architecture, painting and photography. Plans and photographs of recent architecture in Europe, United States and Russia. Articles by Syrkus, J. J. P. Oud, Piet Mondrian, C. van Eesteren, and others. Of special interest is an article by Syrkus (in French): *Le Dynamisme de l'Architecture Moderne*, in which architecture is defined as the simultaneous function of social, economic, technical and plastic (time-space) factors. The significant influence of American construction methods on contemporary design is analyzed together with the relations of architecture to new social conditions and the modern plastic arts.

CONTEMPORARY DETAIL IN COMMON BRICK. Common Brick Manufacturers Association of America, Cleveland, Ohio.

A collection of thirty or more plates presented to the architects and designers of America as "an inspirational exhibit of contemporary brickwork practice." Much current work from Germany and Holland is included. The photographs and detail drawings emphasize, for the most part, brick patterns which are bizarre and complicated.

AMERICAN HOUSING. Edith L. Allen. *The Manual Arts Press*, Peoria, Ill., 1930; 211 p.; $2.00.

A history of American housing from the time of the earliest settlers to today, showing the effects of economic, social and industrial conditions. Elimination or addition of various rooms and elements is traced and reasons given for changes. The chapter dealing with the "era of economic problems," 1918-1928, points out the effects of the automobile and radio, efficiency in utilization of space and the use of ready-cut materials.

As history the book is complete enough for reference use. Little attempt, however, is made to indicate what should be done in housing today other than the statement that changes are essential and that house space might be allotted to fit family sizes. The author suggests the use of houses by rotation—"first, a small house for newly-weds; second, the family with children; lastly, the one for the family whose children have gone from the roof-tree, which will be another small house, having an ample living or conference room where periodic home comings may be enjoyed."

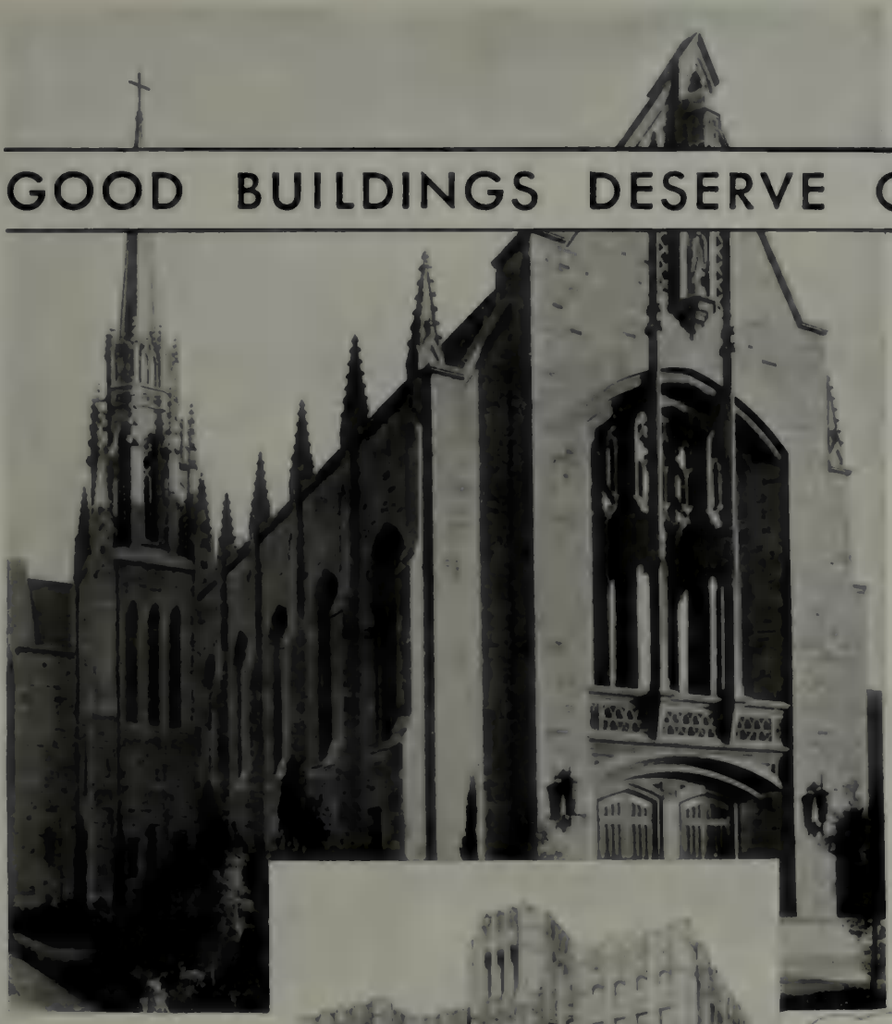
THE FUNDAMENTALS OF GOOD BANK BUILDING. Alfred Hopkins. *The Bankers Publishing Co.*, N. Y., 1930; $7.50.

The author is an architect specializing in banks and the book is illustrated largely with drawings and photographs from his own practice. While one gains the impression that the author-architect is telling how he would do it if he got the job, there is, nevertheless, helpful information on types of plans, vaults, the work-rooms, lighting, ventilation, floors, furnishing and similar items.

(Continued on page 98)

GOOD BUILDINGS DESERVE GOOD HARDWARE

CORBIN



ST. BRENDANS' CHURCH
Architect: E. G. Martin
Contractors: Mutter Bros.
Hardware: Corbin

SUN REALTY BUILDING
Architect: Claud Beelman
Contractors: Herbert M. Baruch Corporation
Hardware: Corbin

UNIVERSITY OF CALIFORNIA LIBRARY
Architect: Geo. W. Kelham
Contractor: J. C. Bannister
Hardware: Corbin





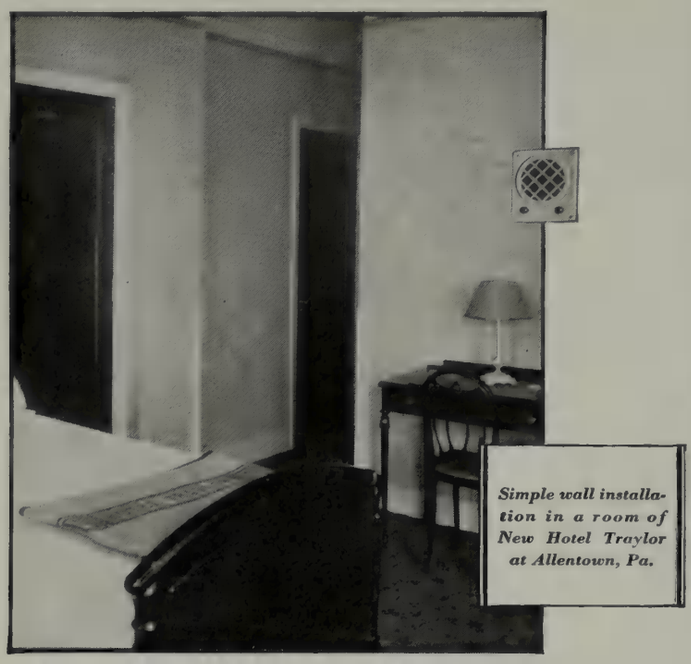
OVIATT BUILDING
Architects: Walker & Eisen
Contractors: P. J. Walker Co.
Hardware: Corbin



THIS distinguished new group of Los Angeles buildings indicates what architects and contractors in this territory think of Corbin hardware

P. & F. CORBIN SINCE 1849 New Britain, Connecticut, U. S. A.
The American Hardware Corporation, Successor

New York Chicago Philadelphia



Simple wall installation in a room of New Hotel Traylor at Allentown, Pa.

GUESTS

come again to hotels with

RCA
CENTRALIZED RADIO

TO be truly modern, a hotel must offer its guests radio entertainment! That's why the new Hotel Traylor installed RCA equipment!

To afford the modern hotel the finest in centralized radio equipment at low cost, RCA offers a centralized receiving system which distributes as many as four different broadcast programs to as many as 5,000 rooms.

By touching a wall switch, the guest can get whichever program he prefers.

RCA Centralized Radio is simple, economical, prevents future wiring costs, and avoids unsightly individual aerials and lead-in connections.



RCA engineers design apparatus to fit the job—the job is never forced to fit the apparatus.

Let us prepare Estimates

Descriptive pamphlets of this system and photographs of typical installations are available to architects and hotel executives.

Without any obligation, we shall gladly prepare plans and estimates for installations of any size.

FOR APARTMENTS

Where the use of individual sets in the rooms, plugged into wall outlets, is desired, there is a separate RCA Centralized System especially designed for the independent use of as many as 80 sets of different makes, operated from a single antenna. Additional groups may be operated from other antenna, if desired. The superior reception assured by this system makes for greater tenant satisfaction and higher rentability.

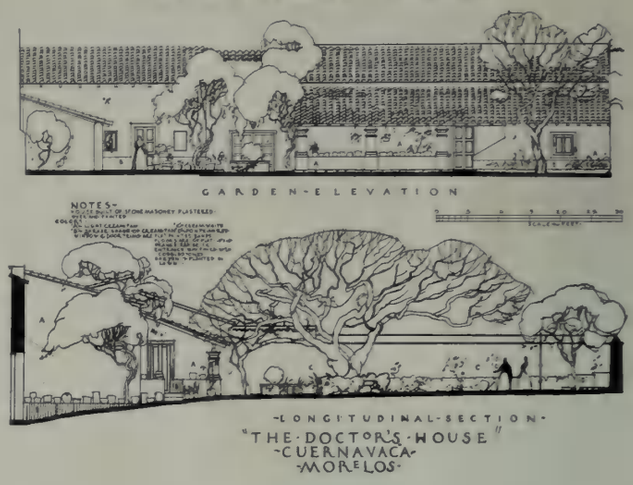
Engineering Products Division, Section A

RCA VICTOR COMPANY, INC.

261 Fifth Avenue New York City

Representatives in Principal Cities

Visit the permanent RCA Centralized Radio Exhibit at the RCA-Victor Salon, Boardwalk, Atlantic City



MEXICAN HOUSES. Richard Garrison and George Rustay. *Architectural Book Publishing Co.*, N. Y., 1930; $15.00.

The photographs and measured drawings in this book were made by two young architects on a ten-months' visit to Mexico in 1928 and 1929. To users of plates the volume will be invaluable, and also to students in rendering. It is not the fruit of research, as the foreword implies, but the by-product of a delightful sojourn in our neighboring land, where leisure, craftsmanship, and a love of color has been written into their humblest dwellings. Some will question the desirability of attempting to take over, in our rush communities, the forms appropriate to Mexico.

FUNDAMENTALS OF ARCHITECTURAL DESIGN. W. W. Turner. *McGraw-Hill Book Co.*, N. Y., 1930; $6.00.

This book is a brave attempt to do the impossible. It covers those mechanical processes commonly taught to the young student of architecture, such as shades and shadows, perspective, drawings of the orders and rendering. It does not set forth the fundamentals of architectural design. Architectural design is the creation of schemes for habitations, working space, living areas, with consideration of man's needs for existence and activity. The book in no way can aid the architect in making better buildings.

NOTES IN BRIEF
AND ARCHITECTS' ANNOUNCEMENTS

M. Louis Kroman, architect, announces the opening of an office at 180 N. Michigan Avenue, Chicago.

Thomas P. Barber and Paul Kingsbury, architects, have formed a partnership with offices at 628–9 Union Insurance Building, Los Angeles.

The office of Joseph Evans Sperry announces with regret the death of the senior member of the firm, Joseph Evans Sperry, on August 6. The practice of architecture will be continued under the same firm name by the surviving partners, Herbert G. Crisp and James R. Edmunds, Jr.

(*Continued on page 100*)





three complete lines

OF KOHLER BRASS . . . DESIGNED TO SPEED THE SALE!

THE modern builder has to plan bathrooms carefully. These days, home and apartment hunters look at that room first. They assume that the plumbing system is efficient. But they want to see for themselves that color, design, and style of fixtures are right—that fittings, down to the last detail, are in complete harmony. Mentally, at least, they may decide to buy or rent right then and there.

When you specify Kohler brass to the builder, you specify fittings built for positive, silent action—divided into three complete groups that meet every taste and pocketbook. The Octachrome series, with clear-cut octagonal lines, includes the latest and most exclusive Kohler designs. Dynamic patterns have rounded, flowing surfaces, and come at a lower price level. The Continental designs have handles and escutcheons of vitreous china, and are still more moderately priced.

Here, every ounce of brass has a purpose

Kohler brass fittings are superbly constructed. The metal is real red brass, with a high virgin copper content. The heavy plated chromium finish, easily cleaned, looks like fine silver; nickel and gold finishes are equally beautiful. . . . No waste material takes up space on Kohler brass-ware—no little gee-gaws that add nothing to the efficiency and ease of operation. Free passageways, ample clearances, and water-tight joints, together with advanced design, make Kohler fittings unusual for their combined utility and style.

Kohler fittings ordered with Kohler fixtures mean that the fittings will *fit*. Kohler Company. *Founded* 1873. Kohler, Wis. —*Shipping Point*, Sheboygan, Wis.—*Branches in principal cities*. . . . Look for the Kohler mark on each fixture and fitting.

1. *The* K-8025 GERARD *lavatory fitting illustrates the forceful beauty of the Dynamic design.*

•

2. *An interesting note is added to this bathroom by the graceful lavatory fittings and the distinctive bath and shower combination with engraved plate, both in Octachrome design.*

•

3. *The* K-8090 BERTRAND *lavatory faucet and* K-7910 *bath and shower fitting in Continental design.*

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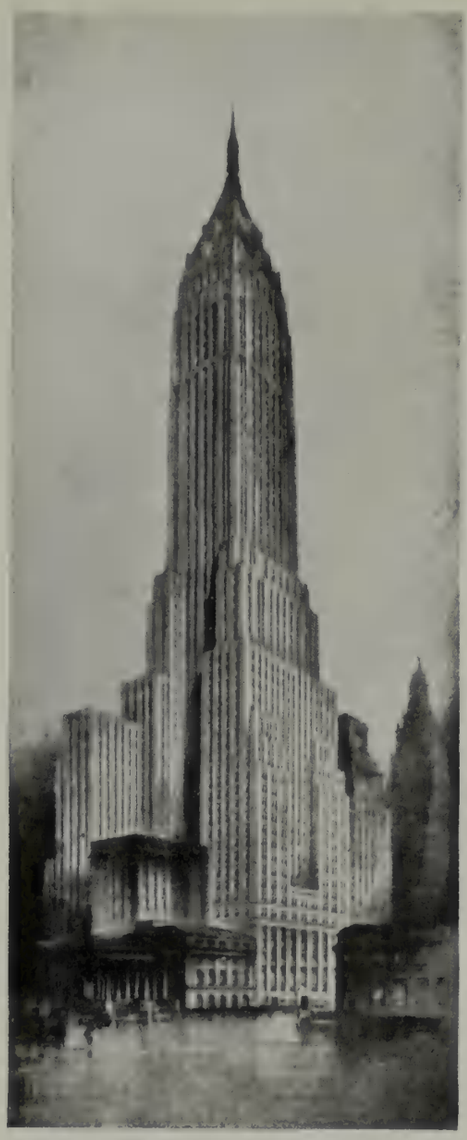
4. *The* K-7424 EMERY *lavatory fitting in Octachrome design has a distinctive grace and beauty.*





KOHLER OF KOHLER

PLUMBING FIXTURES



Bank
of
Manhattan
▪
New York

Another notable structure for which Robert W. Hunt Company were retained for the inspection of all structural steel.

H. C. Severance was the architect, Purdy & Henderson the steel engineers and Starrett Bros., Inc. the general contractors

See Sweet's A4

STEEL AT SHOP AND FIELD
CEMENT—CONCRETE
CONCRETE SUPERINTENDENCE

ROBERT W. HUNT COMPANY
Engineers

Inspection Tests
Insurance Exchange

CHICAGO

All Large Cities

NOTES IN BRIEF—Continued

THE NAME of the firm of Wolf, Sexton, Harper and Trueax, Inc., engineers and architects, has been changed to Wolf, Anderson, Harper and Trueax, Inc. Offices are located in the Tribune Tower, Chicago.

JAMES L. GATLING, architect, has opened an office at 811 Bankers Bond Building, Birmingham, Alabama. He requests manufacturers' catalogs and samples.

WATER TANK DESIGN COMPETITION

The Chicago Bridge and Iron Works announces a competition for a typical tank and tower design which will express "pleasing esthetic qualities." The following prizes are offered for the eight "most interesting" solutions: first prize, $2,000; second, $1,000; third, $500; and five honorable mention prizes of $100 each.

The competition has been approved by the Chicago chapter of the A. I. A. and is open to all architects, engineers and draftsmen who shall have made application by mail to the professional adviser on or before December 1. Albert M. Saxe, architect, 430 No. Michigan Avenue, Chicago, has been appointed as professional adviser.

In order that the greatest possible latitude may be given to the competitors and the maximum of real public service attained, the example chosen as a basis for the designs is what may be called a typical elevated steel tank on a supporting steel structure, to serve a small city or suburban community. The physical requirements shall be as follows (mandatory):

1. The tank shall contain 200,000 gallons, or approximately 26,700 cu. ft.
2. The top of the tank shall be not more than 110 ft. above the ground level; and the low water line, or bottom of the tank shall be not less than 85 ft. above the ground level.
3. The water connection or standpipe from the tank to the ground shall be at least 5 ft. in diameter, which is the size necessary to prevent freezing.
4. All portions of the entire tank and structure must be built entirely of structural steel, but in so doing it must not contain metal work nor sheet metal, the nature of which may be perishable or short lived, either as a result of its design or the frailty of its mass.

In judging the relative merit of the designs, the jury will be governed by the apparent permanency and commercial practicability of the structure, as well as its esthetic qualities.

MACHINE AGE EXPOSITION

Representations of early and modern building construction, together with affiliated activities, will be portrayed in a special machine exhibit which the Museums of the Peaceful Arts, New York City's museum of science and industry, will hold in its new quarters in the News Building, 220 East 42nd Street, from September 12 to November 15, open to the public without charge.

(Continued on page 102)



SAVE ON YOUR MASONRY

BETTER masonry at less cost has made Brixment the world's largest-selling mason's cement:

[1] It costs less than the portland and lime required to make an equal amount of mortar.

[2] No soaking, no slaking. Ready to mix by hand or machine.

[3] Saves bricklayer's time because it's easier to spread and sticks to the headjoint; its unusual plasticity and convenient set help him in striking joints.

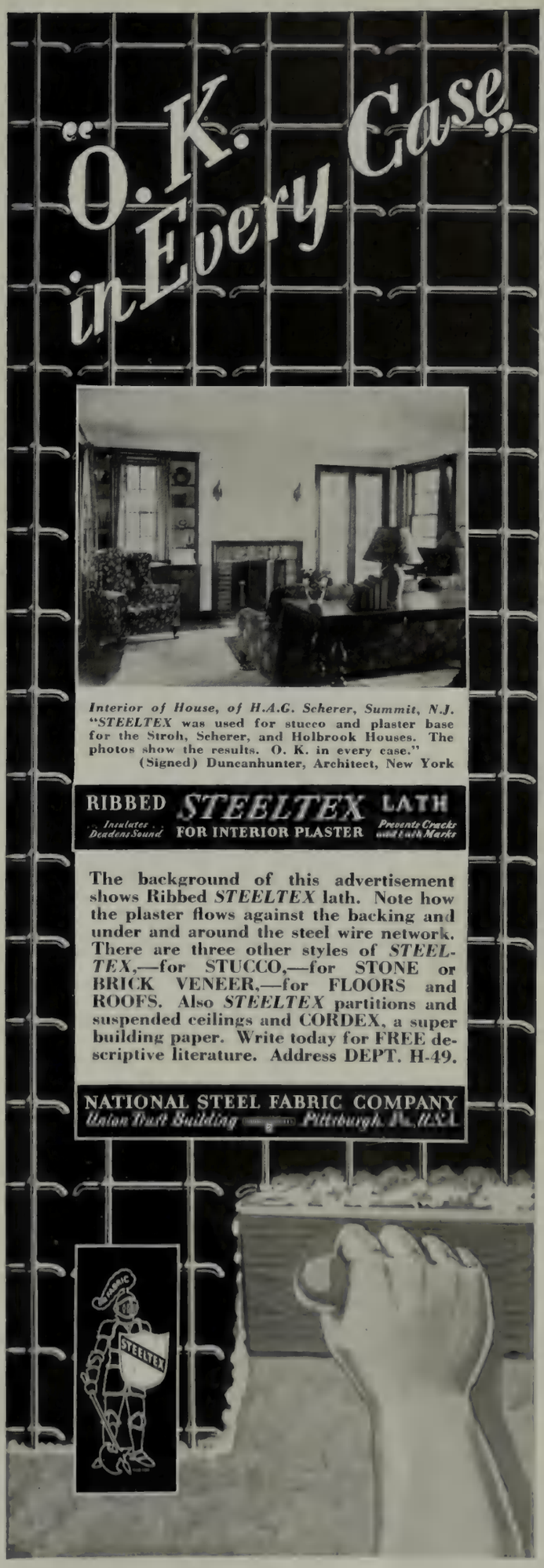
[4] Reduces labor in cleaning down the wall because it doesn't slop down over the face of the brick. Louisville Cement Co., Incorporated, Louisville, Kentucky.

CEMENT MANUFACTURERS SINCE 1830

BRIXMENT

for MASONRY and STUCCO





The exhibit will outline the influences making for machine development: the principal products and services developed since the beginning of the nineteenth century, and representations of power, metals and machine tools.

Exhibits will include a six-foot model of the Empire State Building and a photographic display showing the evolution of the steel skyscraper, arranged through the courtesy of Colonel W. A. Starrett. In the "Industry in Art" section of the exhibit there will be photographic studies of the new Hudson River bridge by Frederick L. Ackerman, architect. Progression studies of a number of recent buildings will also be displayed. Other phases of the construction industry will be shown in representations of bridges, subway and tunnel building, road building, and the like.

The exhibit will also include communications, textiles, transportation, agriculture, metals, power machine tools. Actual machines, many in operation, models, illustrations, statistical graphs, motion pictures and other display media will be used in the presentation of the exhibit.

CITY PLANNING

American cities have begun to emerge from their "pioneering era of ugliness," according to a report by the committee on city and regional planning of the American Institute of Architects, made public by Robert D. Kohn, president of the institute.

Major traffic street plans calling for the expenditure of hundreds of millions of dollars have been completed in one hundred forty-four cities and begun in sixty-four others. The report points to the New York State law forbidding building where the city council has adopted the street plan and to Schenectady, N. Y., which has adopted its complete plan, as examples of intelligent progress. St. Louis continues to develop the most consistent city planning work in the country under Harland Bartholomew, city planner, and E. J. Rossell, architect, the report says.

Smaller cities, even small towns need street plans as much as metropolitan areas because of increased use of the automobile, demands for airports, parks and enlarged business centers.

Because of the demand for wider streets, great avenues of trees are being sacrificed and cities denuded of shade, uncovering graceless architecture. California has a law requiring trees to be replanted as the streets are widened.

"More cities are adopting the 10-25-40 standard, that is, ten acres for each elementary school, playground and park, about a mile apart in metropolitan areas; twenty-five acres for junior high school and playfields about every two miles and forty acres for senior high schools and junior colleges three miles apart," the report continues.

"Regional planning activity in the United States has materially increased, particularly in and about Chicago, Los Angeles, Philadelphia and Washington. Many new county planning commissions have been established."

Trading Dollars

NO ONE ever made any money doing this unless the other fellow was "short changed." This "short changing" process seems to be responsible for a good deal of unsatisfactory work. It is one method of getting blood out of a stone.

The consistently "low man" hands in a figure which looks like an even exchange of currency. You feel that you are putting HIS profit in YOUR pocket . . . that is, until you look at the completed work. Then you feel sorry for yourself and wish to Heaven you had taken a figure more consistent with good workmanship. SPECIFY PARDEE TILES . . . and then insist on a PARDEE BONDED INSTALLATION.



Pardee Supplies Whatever You Need in Tile

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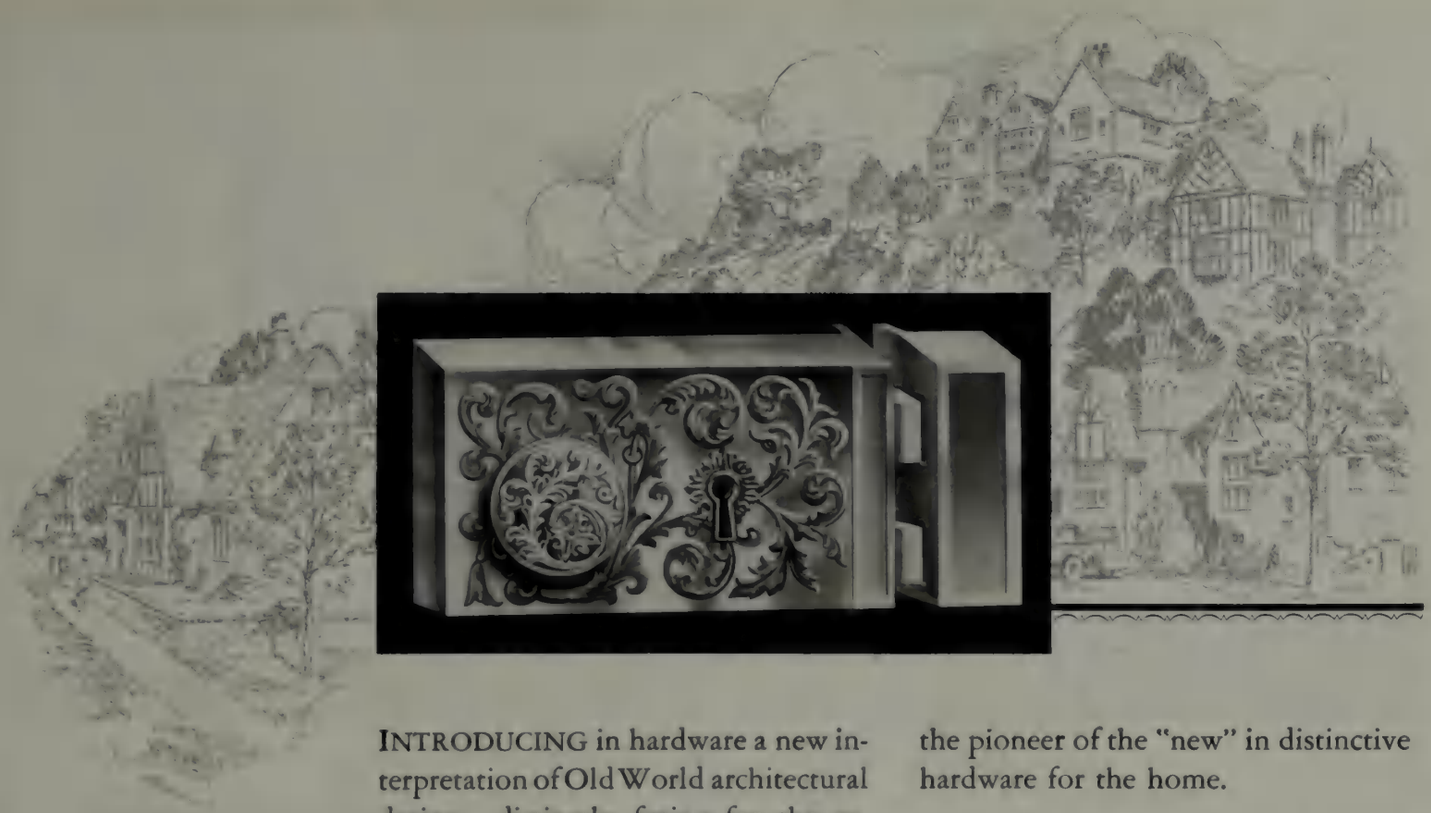
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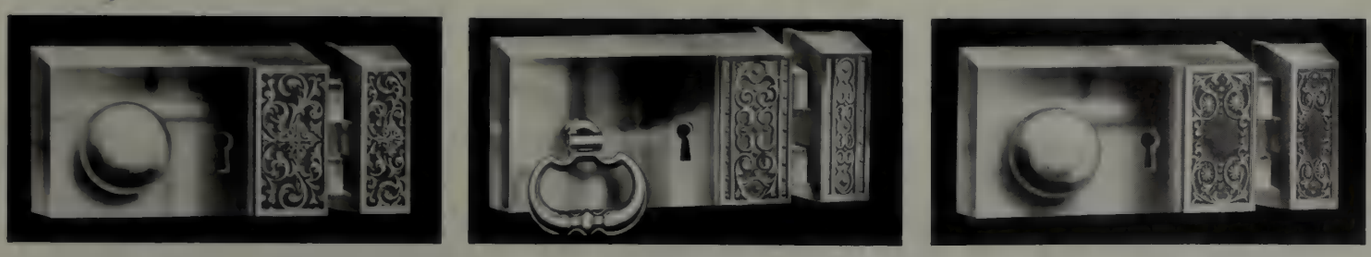
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For the Architect's convenience RUSSWIN Hardware is illustrated and described in Sweet's catalogue, pages C-3137—C-3216.



Dining Hall, Georgia State Industrial College, Savannah, Ga. Cletus W. Bergen, Architect. Union Metal Columns and Pilasters (Design 237) used.

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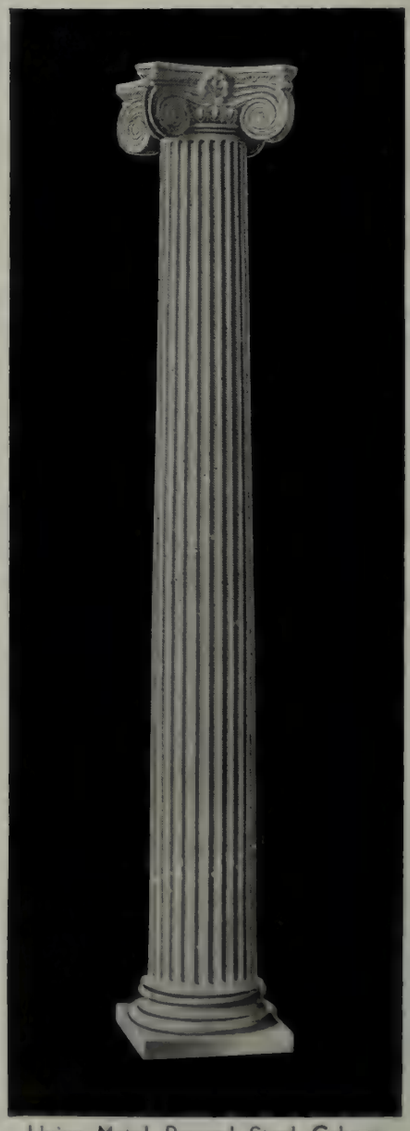
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Represented in the new 4-volume
Sweet's for 1930, Vol. A, page 453

VICTOR OOLITIC STONE CO.

Bloomington, Indiana



Dining Hall, Georgia State Industrial College, Savannah, Ga. Cletus W. Bergen, Architect. Union Metal Columns and Pilasters (Design 237) used.

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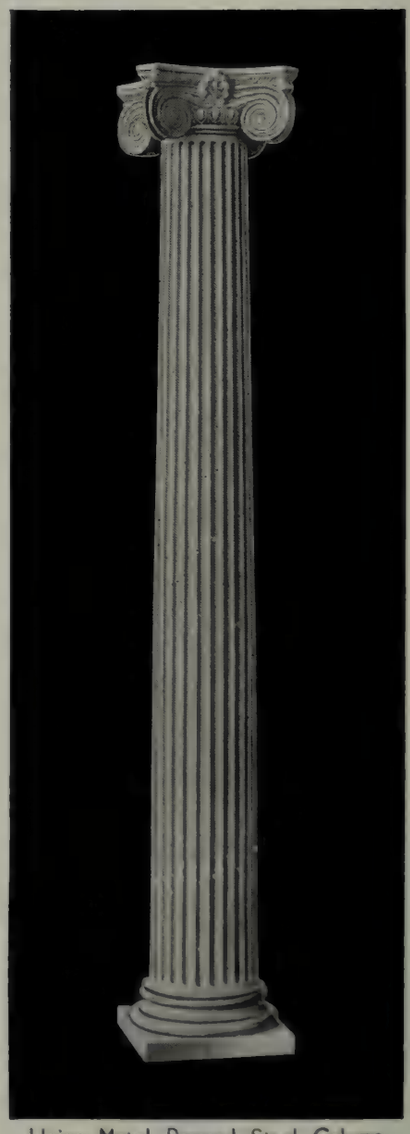
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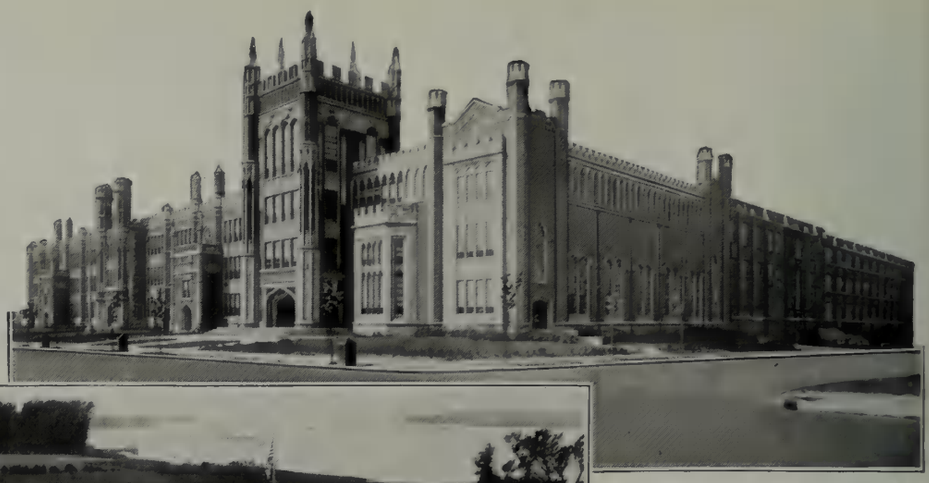
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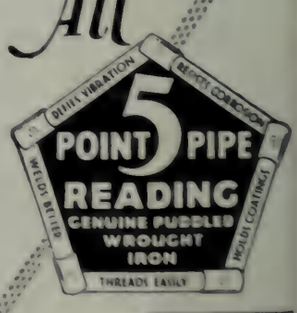
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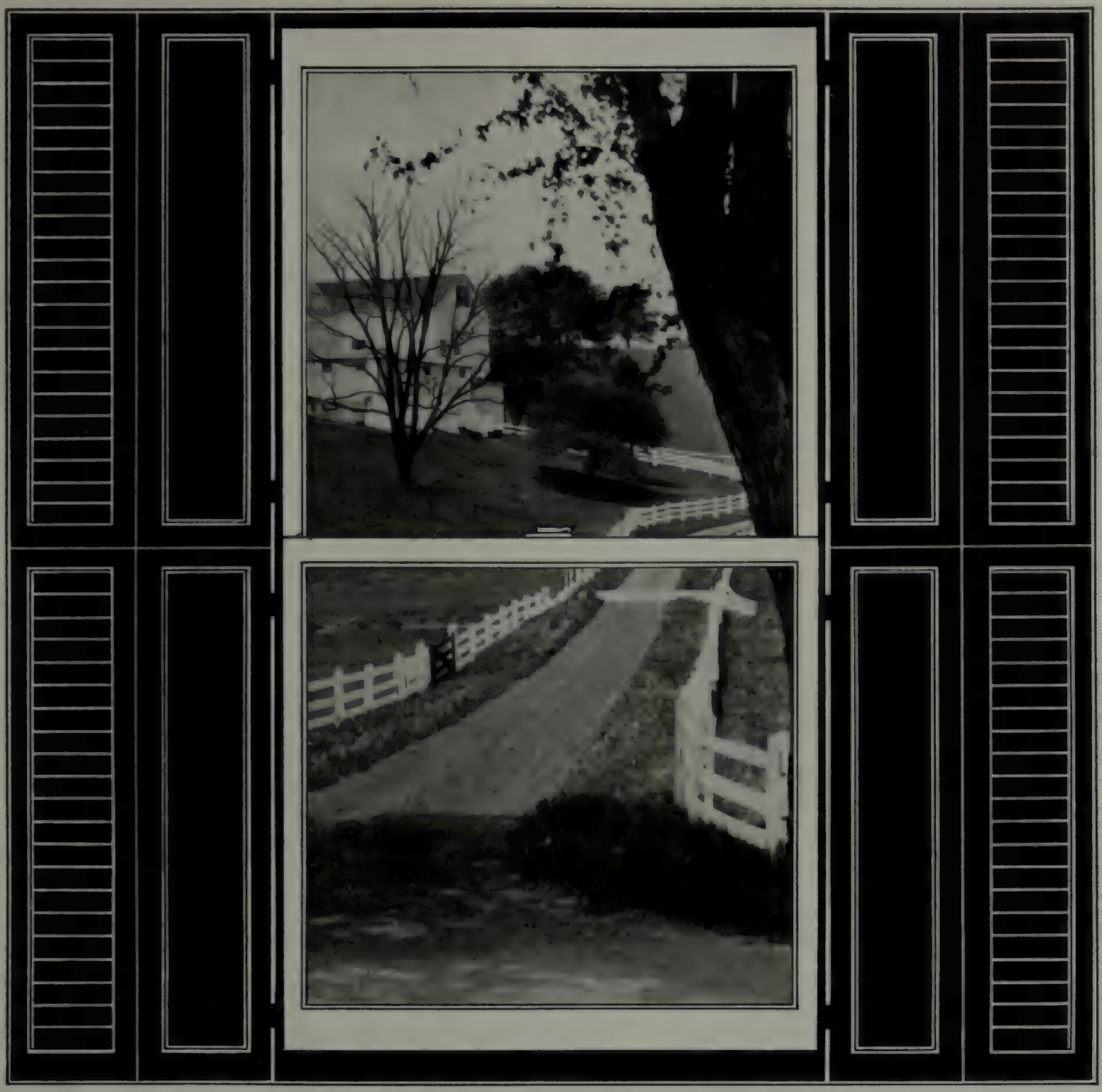
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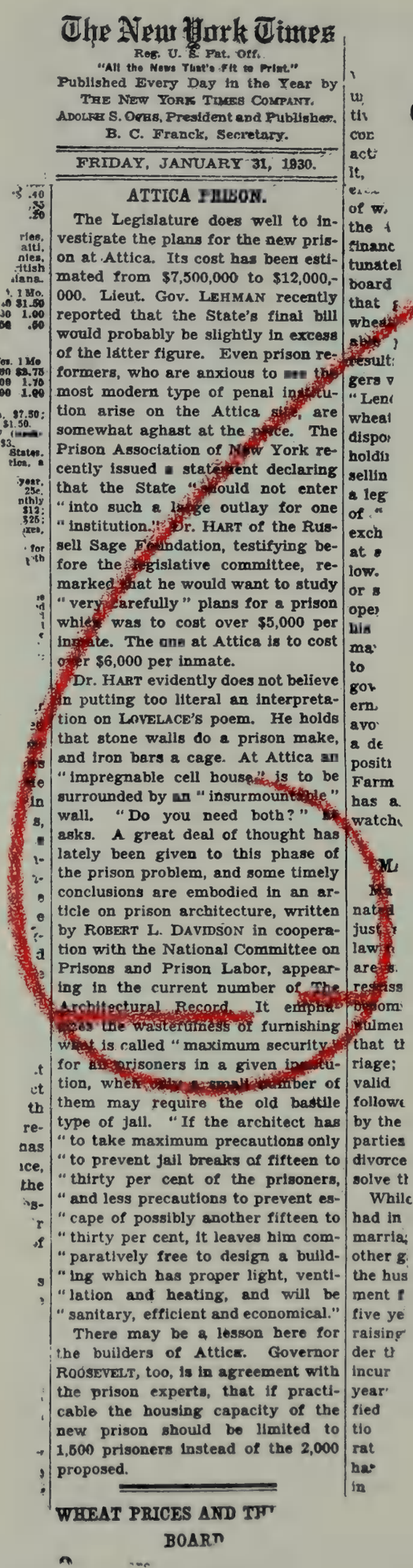


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FRIDAY, JANUARY 31, 1930.

ATTICA PRISON.

The Legislature does well to investigate the plans for the new prison at Attica. Its cost has been estimated from $7,500,000 to $12,000,000. Lieut. Gov. LEHMAN recently reported that the State's final bill would probably be slightly in excess of the latter figure. Even prison reformers, who are anxious to see the most modern type of penal institution arise on the Attica site, are somewhat aghast at the price. The Prison Association of New York recently issued a statement declaring that the State "should not enter "into such a large outlay for one "institution." Dr. HART of the Russell Sage Foundation, testifying before the legislative committee, remarked that he would want to study "very carefully" plans for a prison which was to cost over $5,000 per inmate. The one at Attica is to cost over $6,000 per inmate.

Dr. HART evidently does not believe in putting too literal an interpretation on LOVELACE'S poem. He holds that stone walls do a prison make, and iron bars a cage. At Attica an "impregnable cell house" is to be surrounded by an "insurmountable" wall. "Do you need both?" he asks. A great deal of thought has lately been given to this phase of the prison problem, and some timely conclusions are embodied in an article on prison architecture, written by ROBERT L. DAVIDSON in cooperation with the National Committee on Prisons and Prison Labor, appearing in the current number of The Architectural Record. It emphasizes the wastefulness of furnishing what is called "maximum security" for all prisoners in a given institution, when only a small number of them may require the old bastile type of jail. "If the architect has "to take maximum precautions only "to prevent jail breaks of fifteen to "thirty per cent of the prisoners, "and less precautions to prevent es- "cape of possibly another fifteen to "thirty per cent, it leaves him com- "paratively free to design a build- "ing which has proper light, venti- "lation and heating, and will be "sanitary, efficient and economical."

There may be a lesson here for the builders of Attica. Governor ROOSEVELT, too, is in agreement with the prison experts, that if practicable the housing capacity of the new prison should be limited to 1,500 prisoners instead of the 2,000 proposed.

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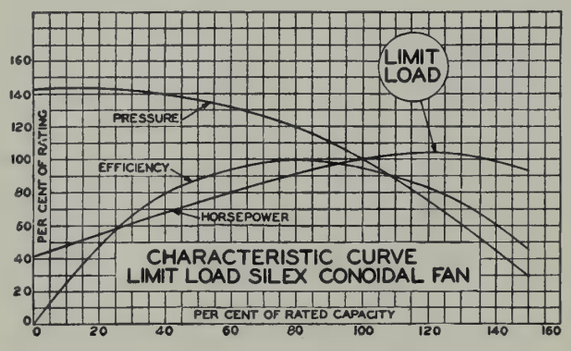
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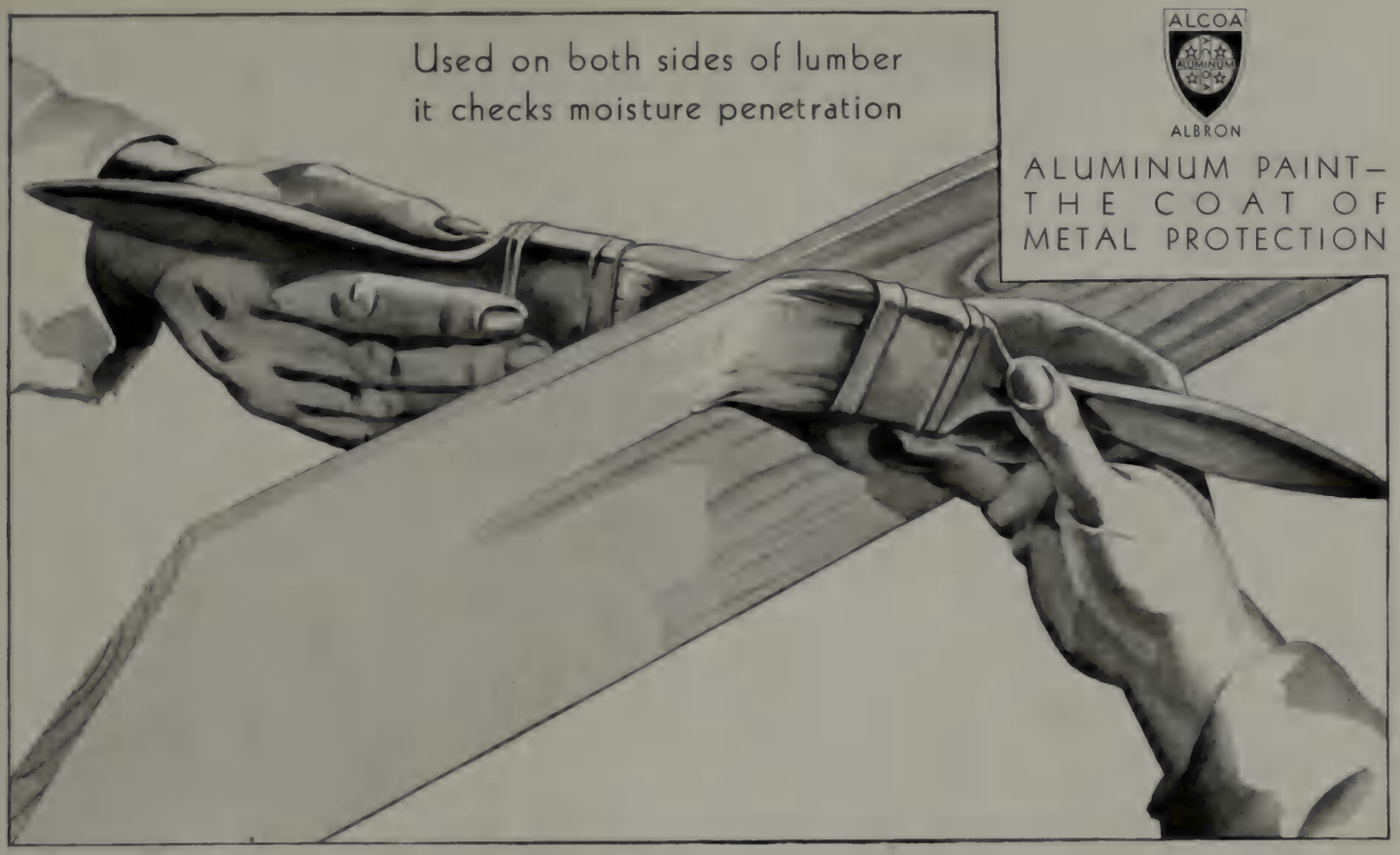


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GEORGE A. CHAPMAN, A.I.A.; educated Pratt Institute; associated at various times with Stevenson & Green, Van Vleck & Goldsmith, Lord & Hewlett, D. Everett Waid and E. L. Margueray; private practice 1908-26 under firm name of Tyrie & Chapman; assisted in organizing The Architect's Small House Service Bureau and for several years, secretary and treasurer of United States Bureau; member A.I.A. Structural Service Committee 1923; organized The Architectural Council 1924, in which acted as consultant to adapt building products to architectural needs, also in formulating catalogue material to meet architects' needs; consulting architect for Sweet's Catalogue Service since 1926.

ALBERTO LYNWOOD FERGUSON; Educated University of Pennsylvania, B.S. in architecture 1920; member National Industrial Advertisers Association; Technical Secretary, 1920-26 and Managing Director, 1926-28, Structural Service Bureau; author of numerous magazine articles on advertising for architects published in last eight years; consulting architect for Sweet's Catalogue Service since 1928.



JOSEPH A. McCARROLL, A.I.A.; registered architect New York; educated Cornell University, B.S. in architecture 1895; associated at various times with Morgan & Walls, Parkinson & Bergstrom, R. A. Herold, W. Marbury Somervell, and Thomas W. Lamb; private practice 15 years; wide experience in building construction with Thompson Starrett & Co., Faux, McCarroll Construction Co.; consulting architect for Sweet's Catalogue Service, 1930.



JAMES EDWIN MEEK, Consulting Architect; educated Columbia University, Architecture; associated at various times with Carrere & Hastings, John Russell Pope, James Gamble Rogers and others, formerly associate architect, Board of Education, New York; specializes in checking of drawings and specifications; consulting architect for Sweet's Catalogue Service since 1917.



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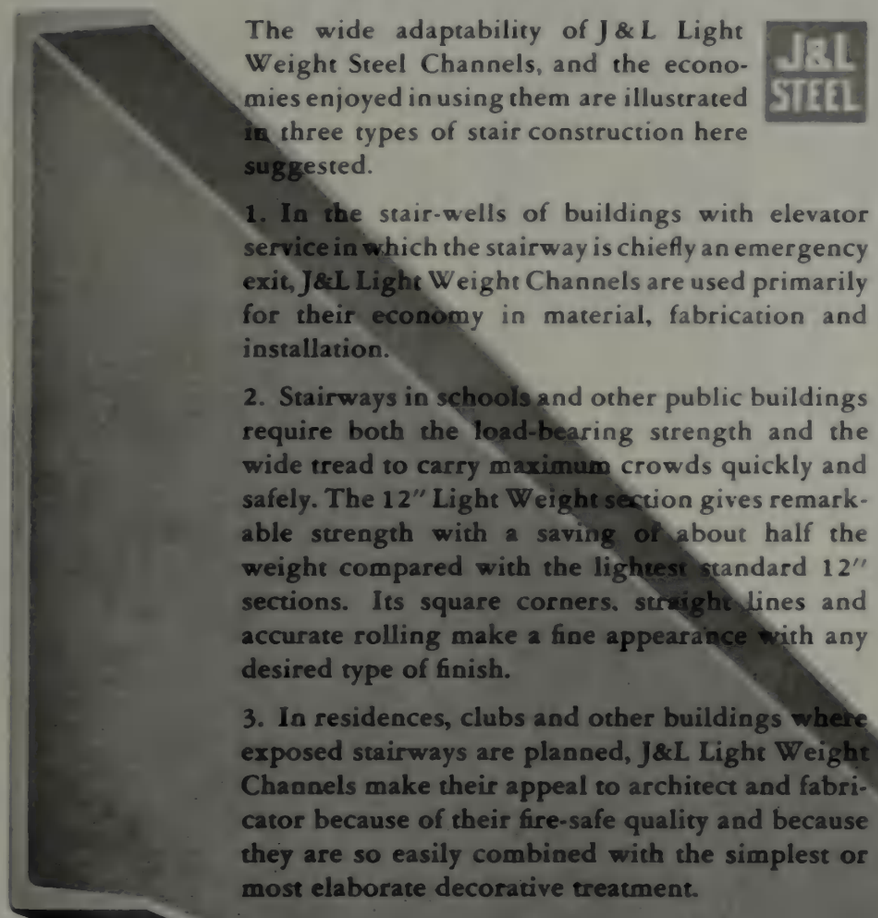
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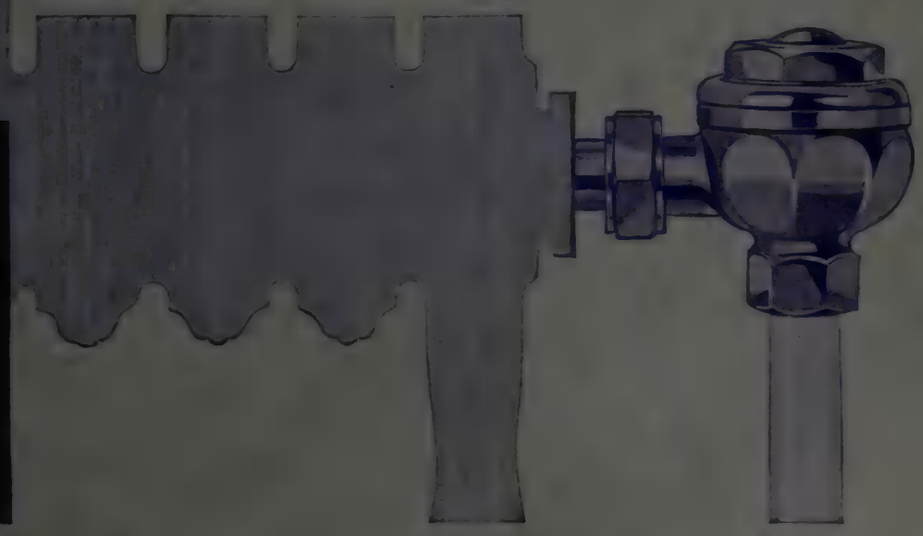
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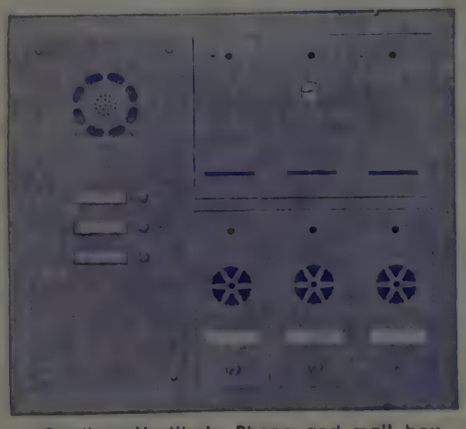
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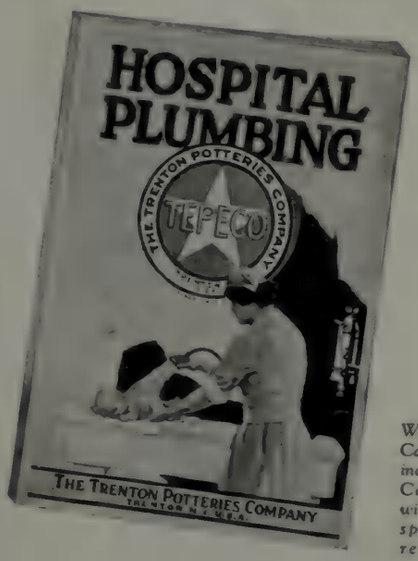


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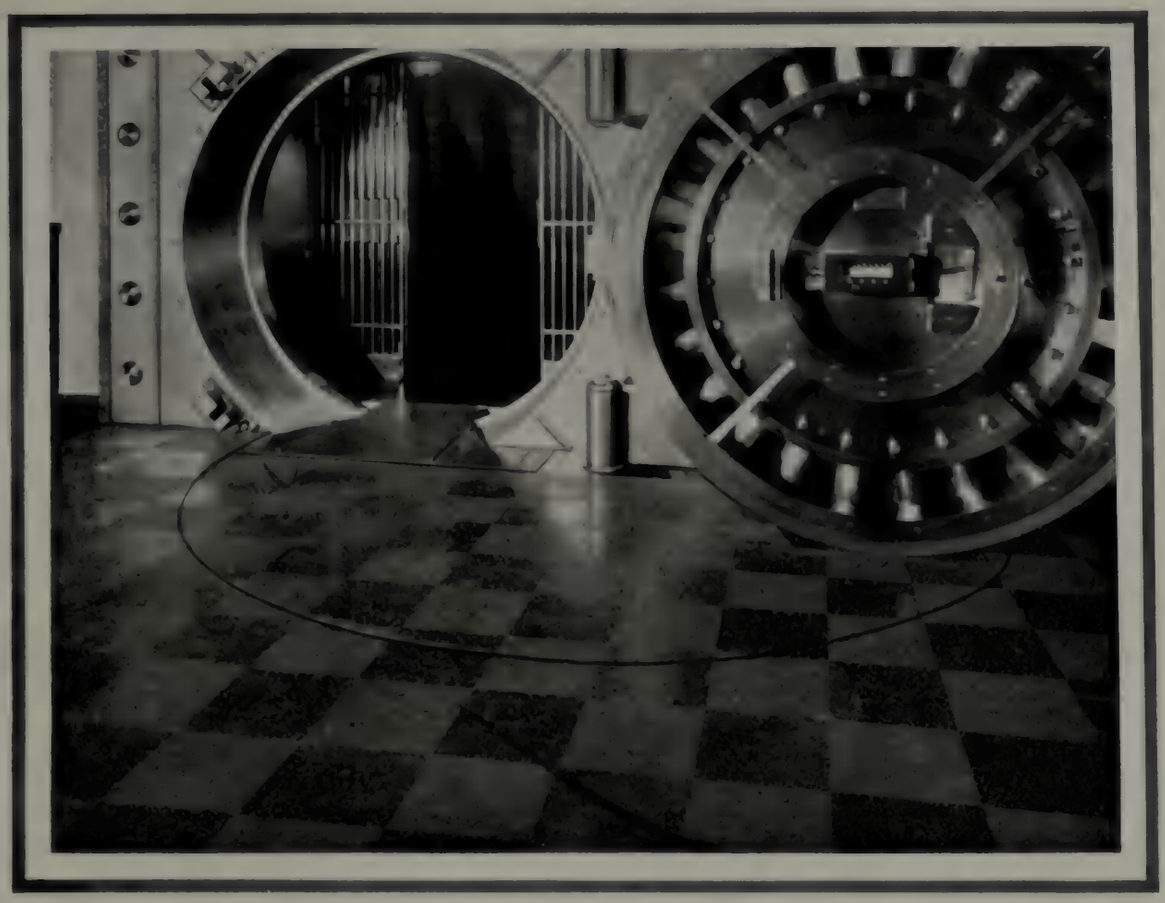
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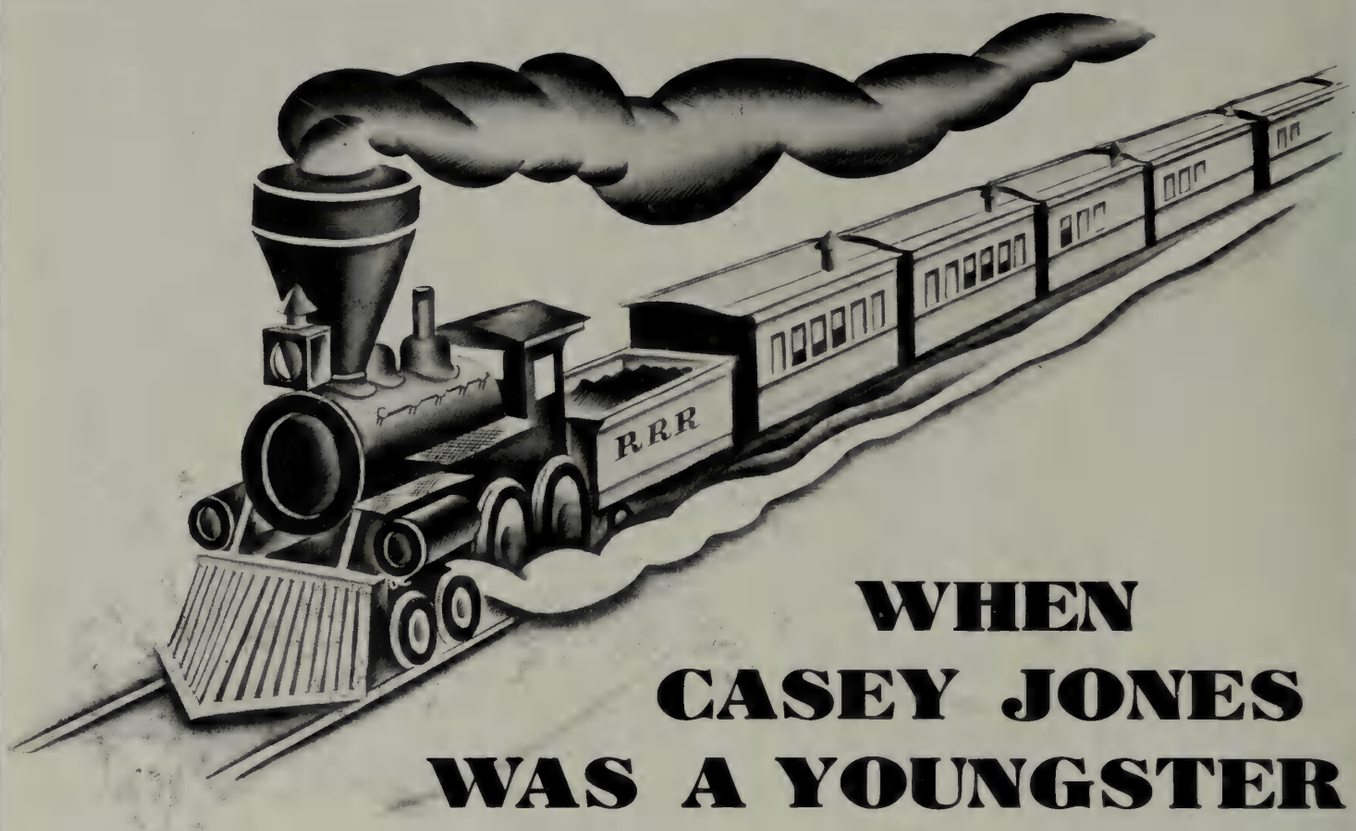
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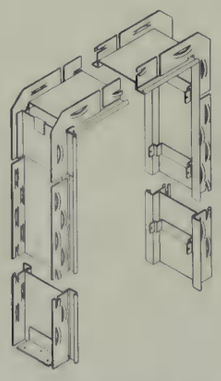


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PENROSE V. STOUT is one of the younger group of New York architects, with an extensive suburban practice. His reputation, founded on residential work in Westchester County, has been enhanced in recent years by his designs for a number of apartment and community house groups at Bronxville, N. Y. A firm believer in the personal element in architecture, Mr. Stout's work shows, by its individuality and essential fitness, how thoroughly his principles are carried out in actual design. He is only interested in abstract design as it relates to human needs, which accounts for the combination of fundamental logic and delicacy of handling to be found in his work. Though a stylist in the proper sense of the word, he allows himself a freedom and variety of treatment which is in keeping with the principle that the personality of a client should find adequate response in a house designed for his use.



Brooklands Apartment development, in Bronxville, N. Y., a recent commission executed by Mr. Stout

Mr. Stout, a graduate of Alabama Polytechnic, is a member of the American Institute of Architects, and of the Architural League. Among those for whom he has designed residences, are: Arthur W. Lawrence, Joseph Walworth, Anthony H. G. Fokker, Dr. Henry Dwight Chapin, Robert S. Chapin, Dr. Frederick W. Pratt, Carroll L. Wainwright, Charles P. Luckey, and the late Theodore F. Merseles. Besides residential work, Mr. Stout has designed various types of buildings for the Village of Lawrence Farms, at Mount Kisco, N. Y., including the Lawrence Farms Country Club, and has done work for the Village of Bronxville and the Westchester County Park Commission. More important projects are the Women's Club and the Brooklands Apartment development, both at Bronxville, N. Y., the Charleston, S. C., estate for Hugh S. Robertson and the Banco di Napoli Trust Company in New York City.



International Commercial Photo

Office and roof terrace of Mr. Stout. Situated on the thirtieth floor of the Graybar Building, this suite commands an inspiring view of New York's skyscrapers

PENROSE V. STOUT
ARCHITECT
GRAYBAR BUILDING - NEW YORK

A.H.FULLER

June 26, 1930

F.W. Dodge Corporation
119 West 40th Street
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Attention Mr. Gayne T.K.Norton

Dear Mr. Norton,

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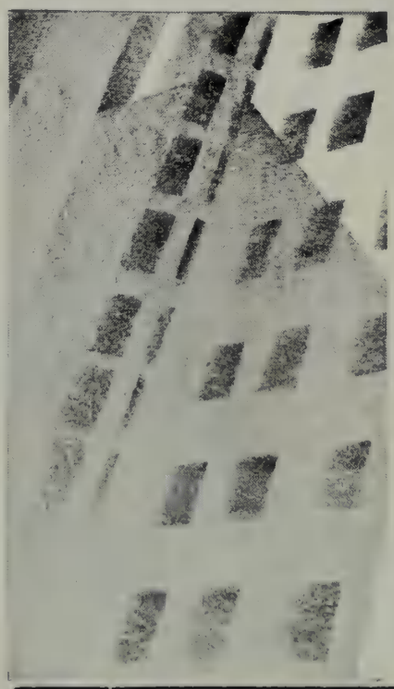
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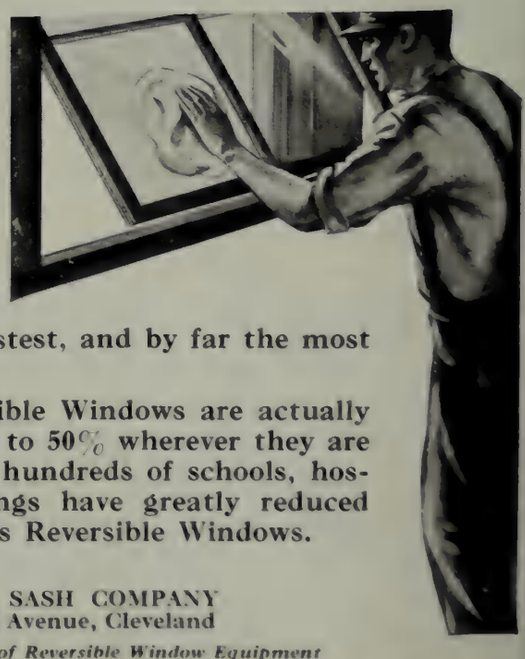
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The PeerVent System gives perfect results in connection with any high pressure, vapor, vacuum, gravity or modulation steam heating system.

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Results from Scientifically Blended ASPHALTS

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But there is no record of successful applications until the Par-Lock organization solved the problem of correct materials and methods.

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Filling Drums of Par-Lock Asphalt

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They are kettled according to a formula that is the result of much research, thinned with volatile ingredients, whose composition was learned by long experimentation and placed in 100 barrel tanks for seasoning and decantation, before shipment in new steel containers bearing the Par-Lock label.

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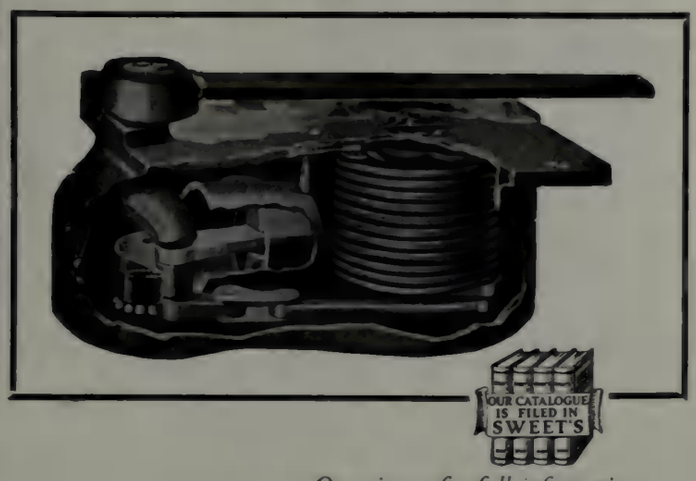
Rixson No. 20 and 25 Single Acting Floor Checks, insuring positive closing in a single swing, were used on the Paramount Theater Building. The architects were C. W. and George L. Rapp; the contractors Thompson-Starrett, Inc. (Photo by Wurts Bros.).

At the Daily Gateway of Thousands

If you could count the number of people who enter the Paramount Theater Building during one day—and remain to watch the night crowds of Broadway surge in and out of this popular theater — Then you could appreciate the sturdiness of the Rixson Floor Checks which patiently close these doors millions of times in a year—endless trillions of times in their years of usefulness.

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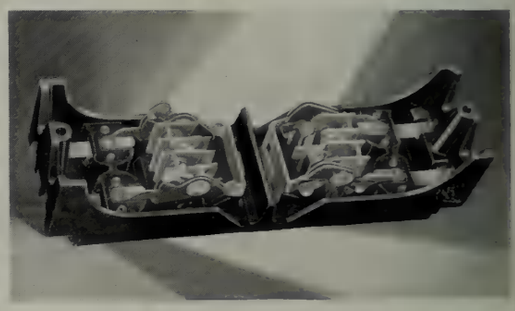
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A New Panelboard —typically Ⓕ

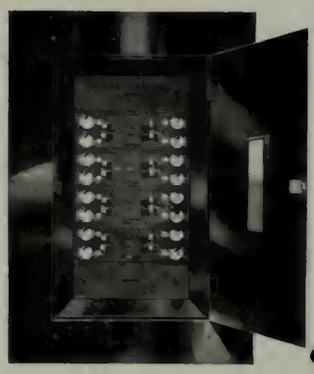
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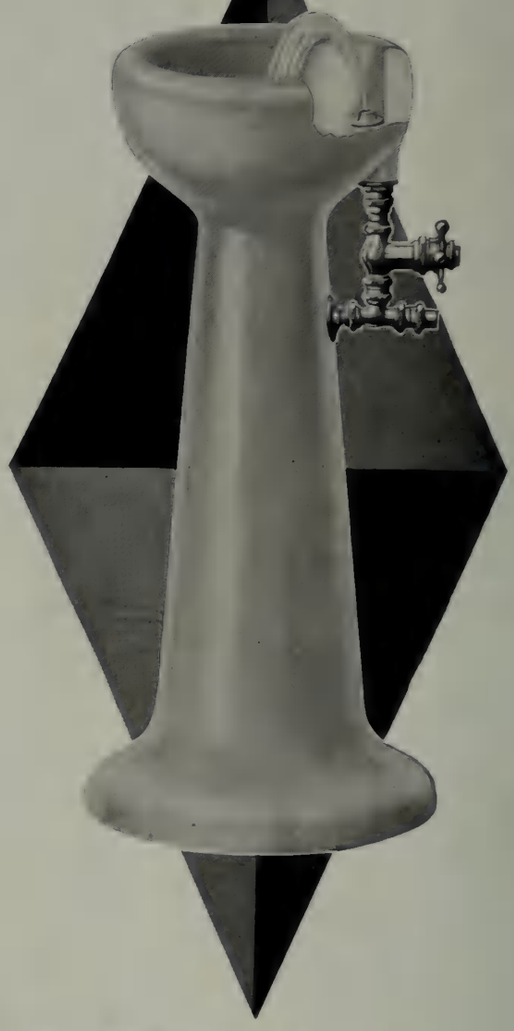
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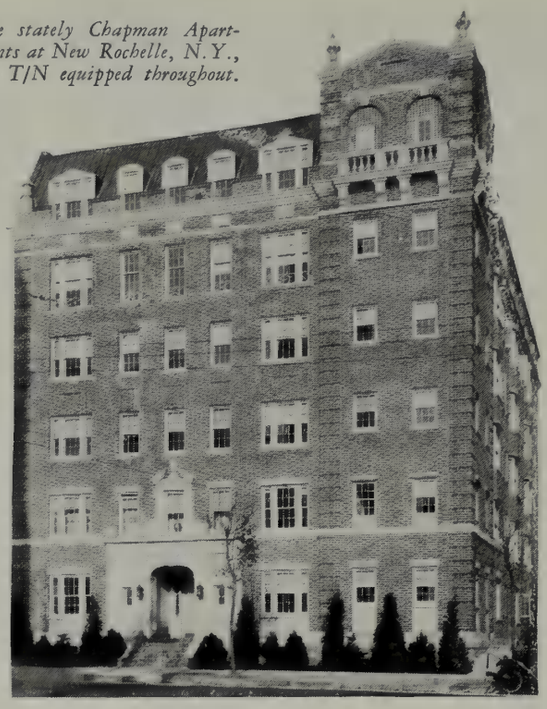
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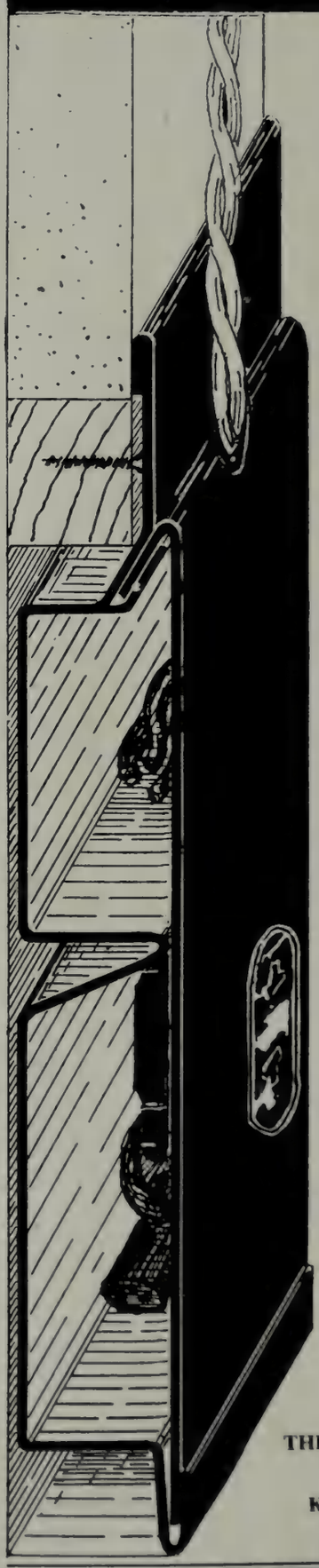
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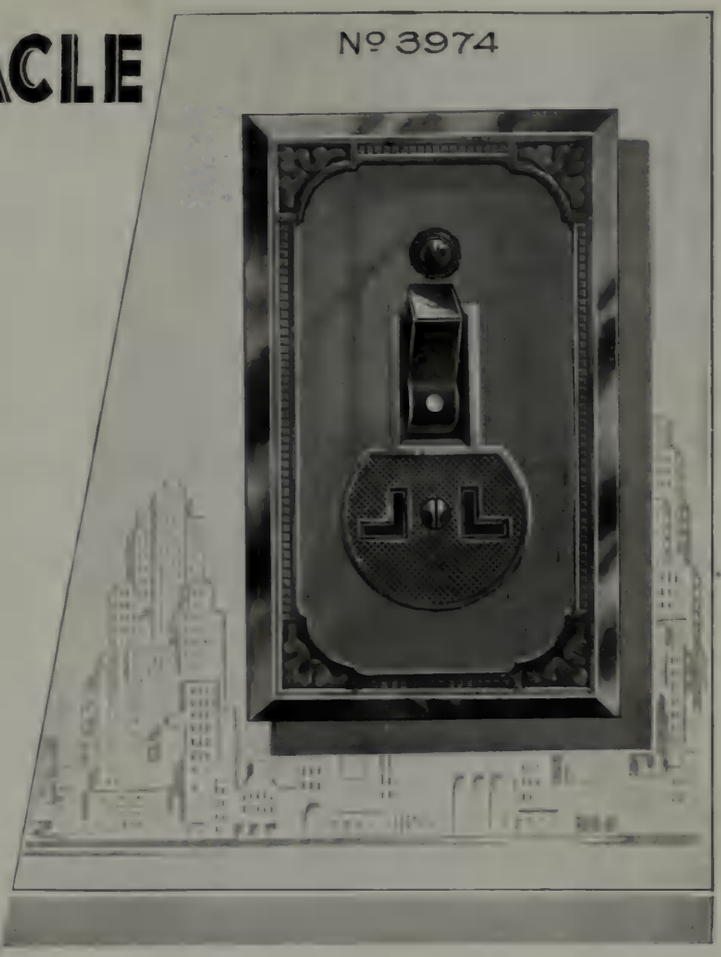
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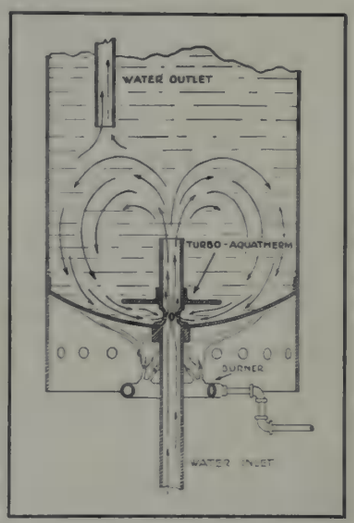
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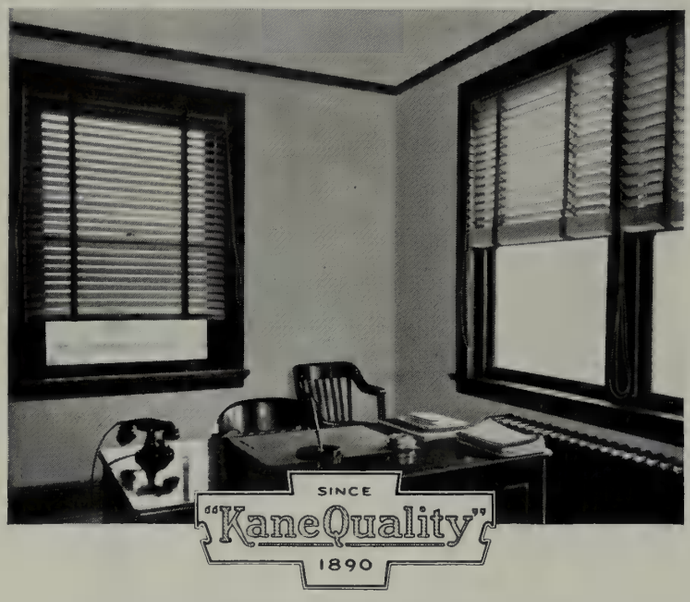
Arrows show action of water when drawn through TURBO-AQUATHERM, scouring bottom of boiler and preventing any accumulation of sediment.

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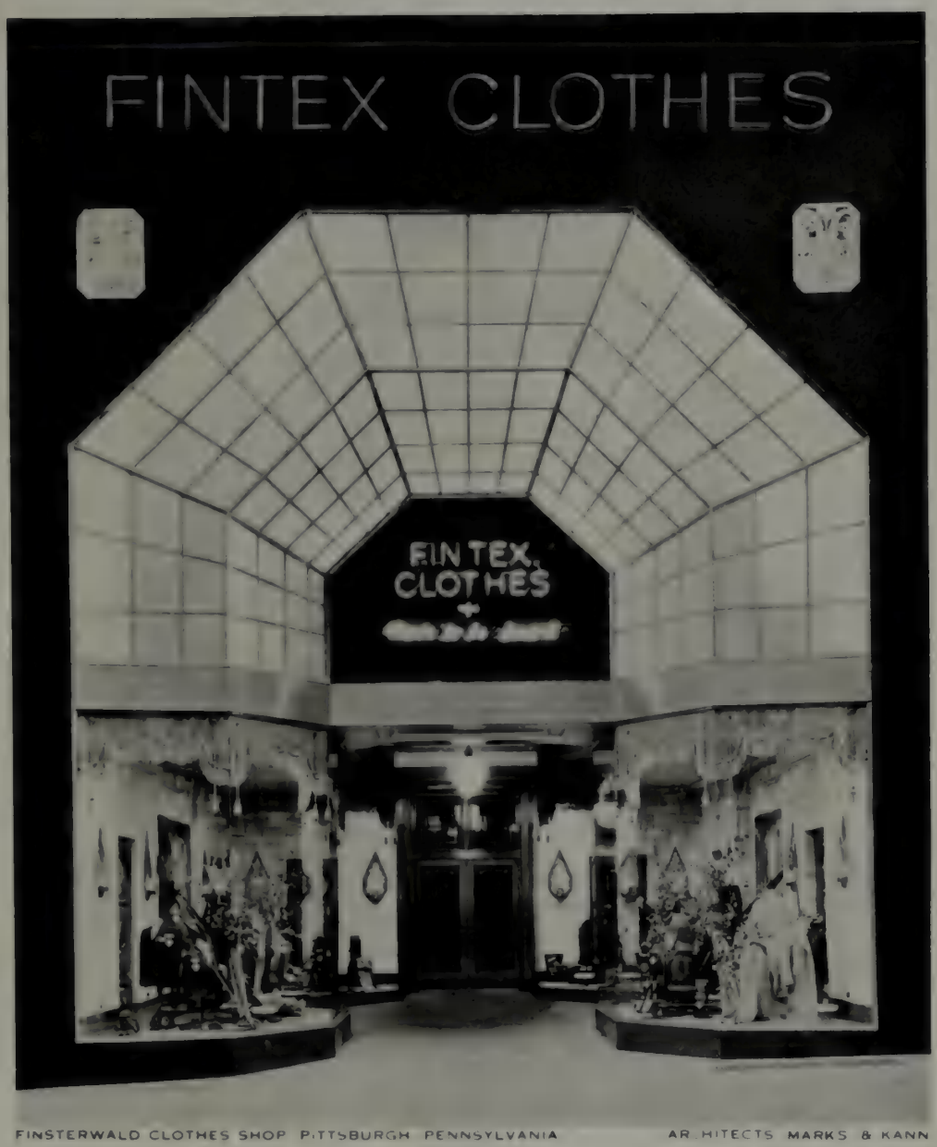
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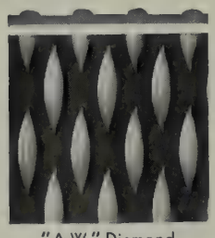
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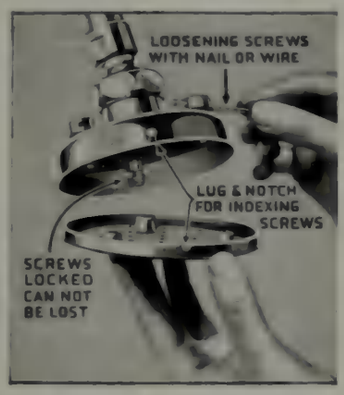
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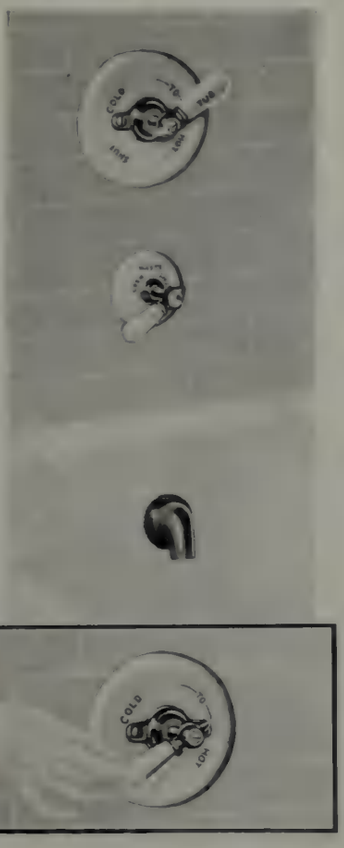


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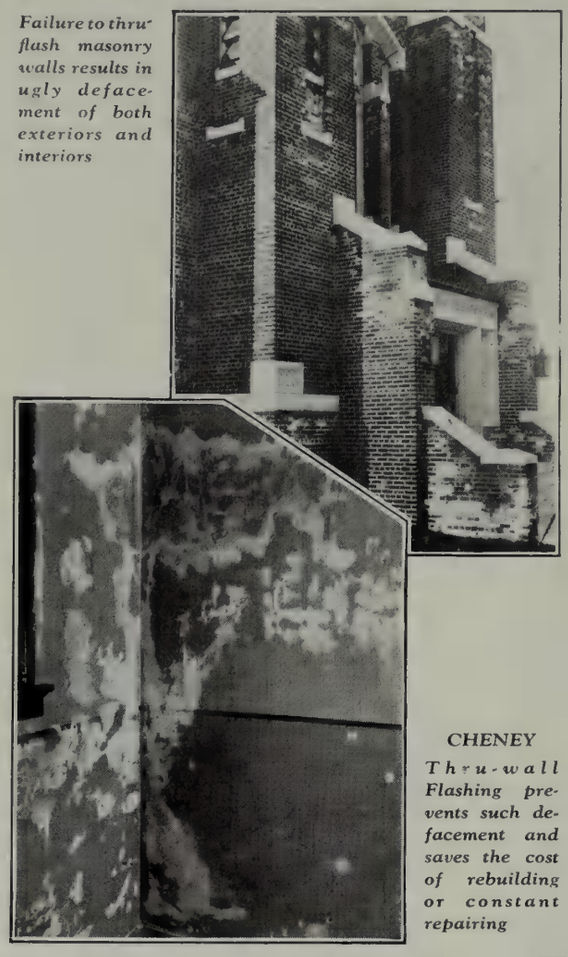
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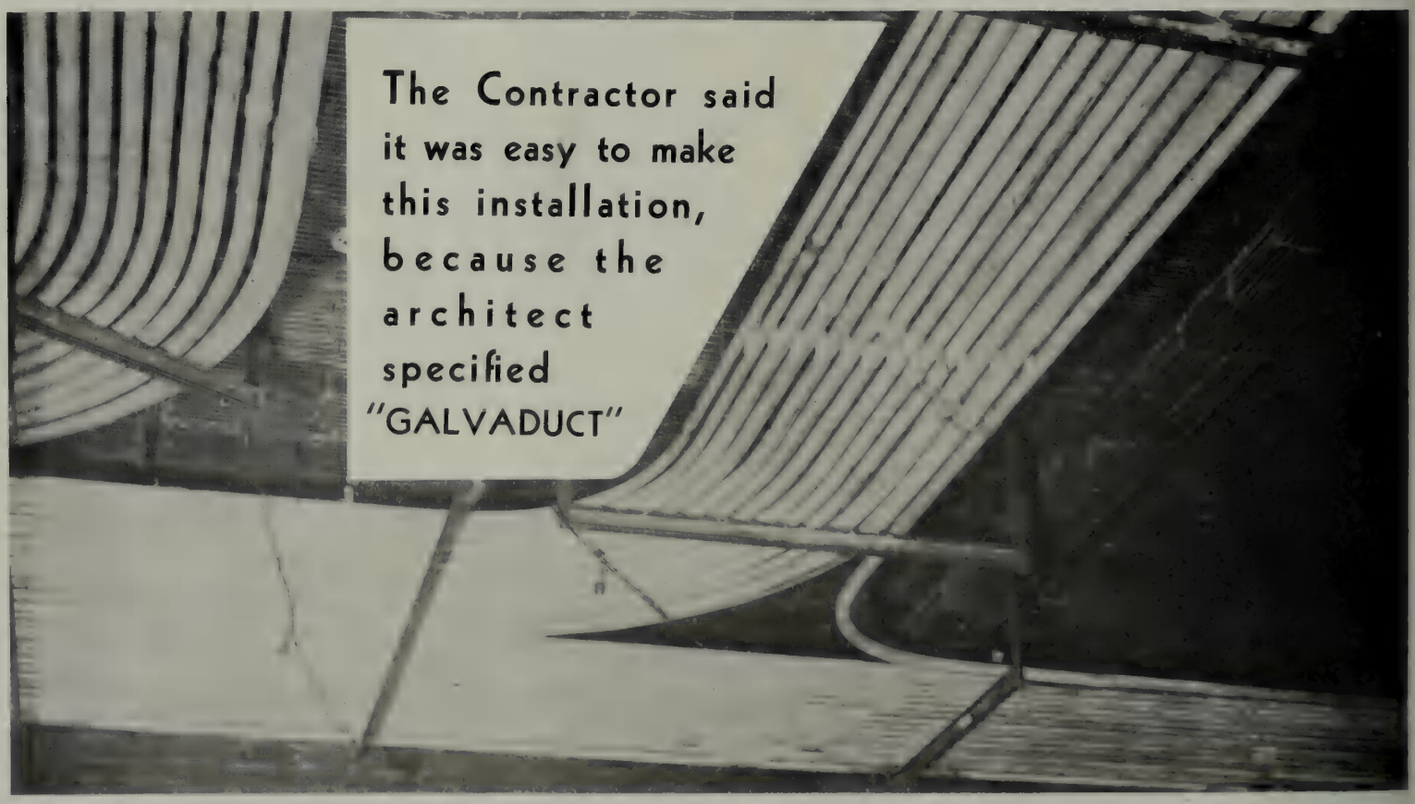
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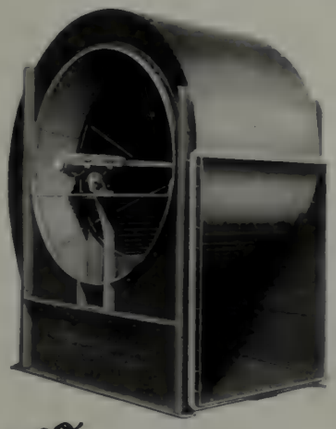


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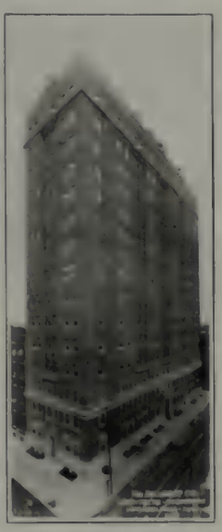
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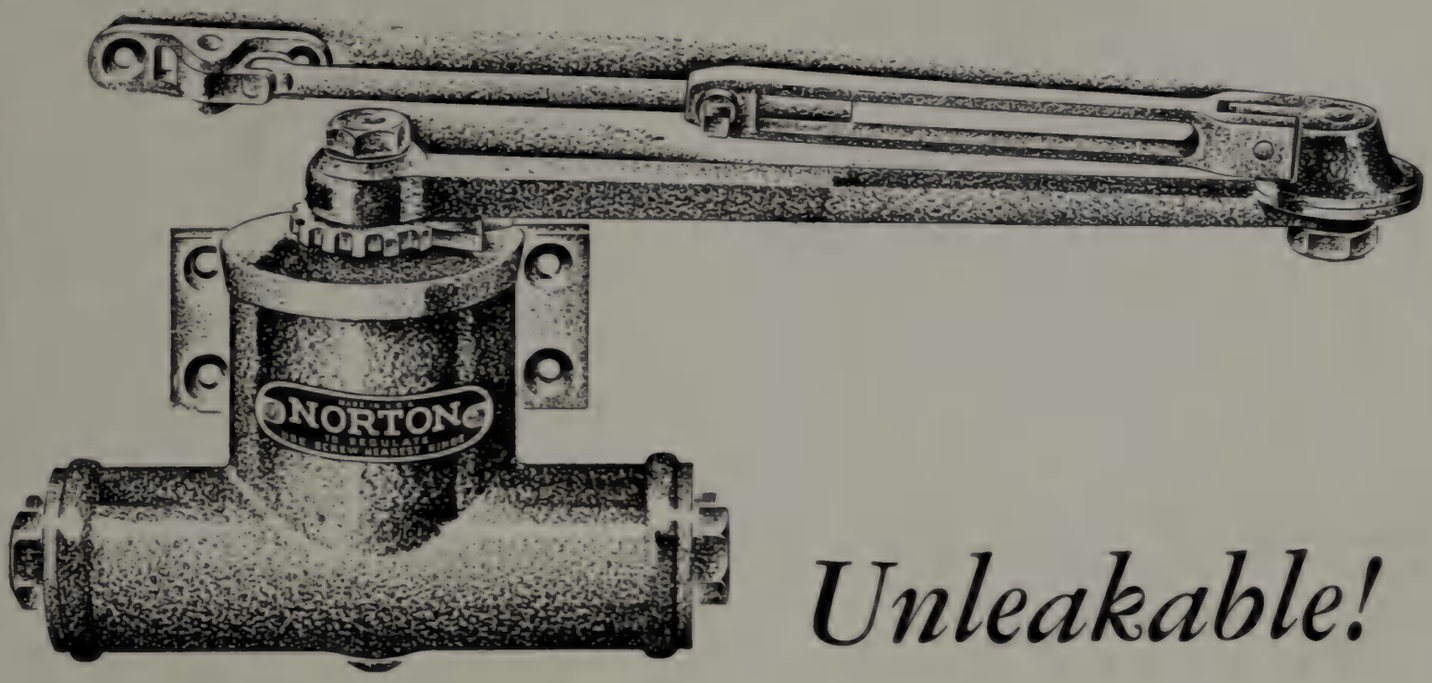
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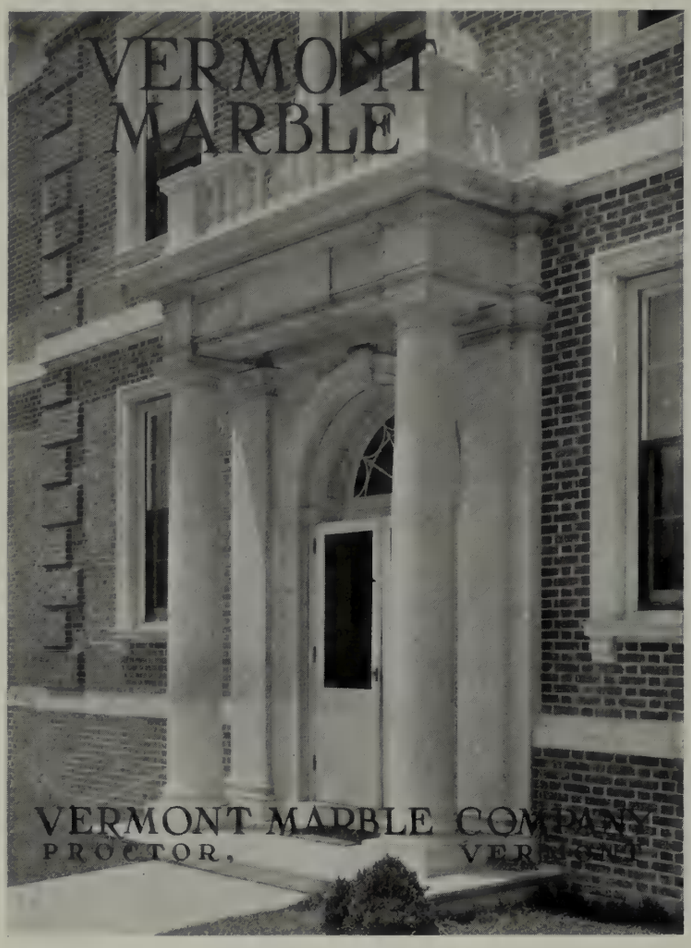
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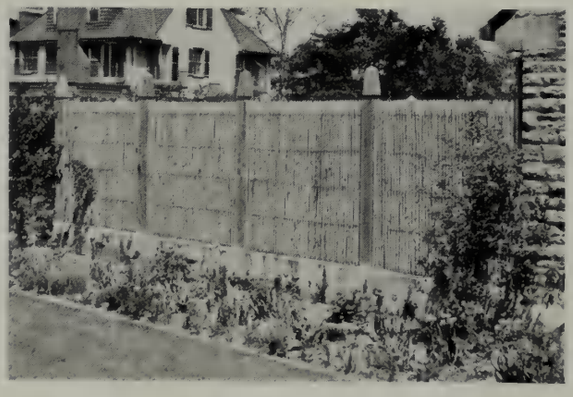
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Figure 237
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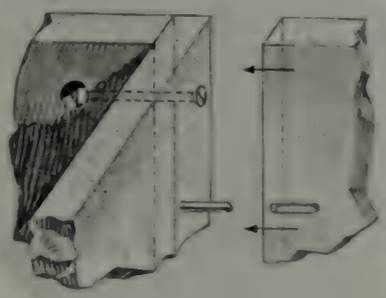
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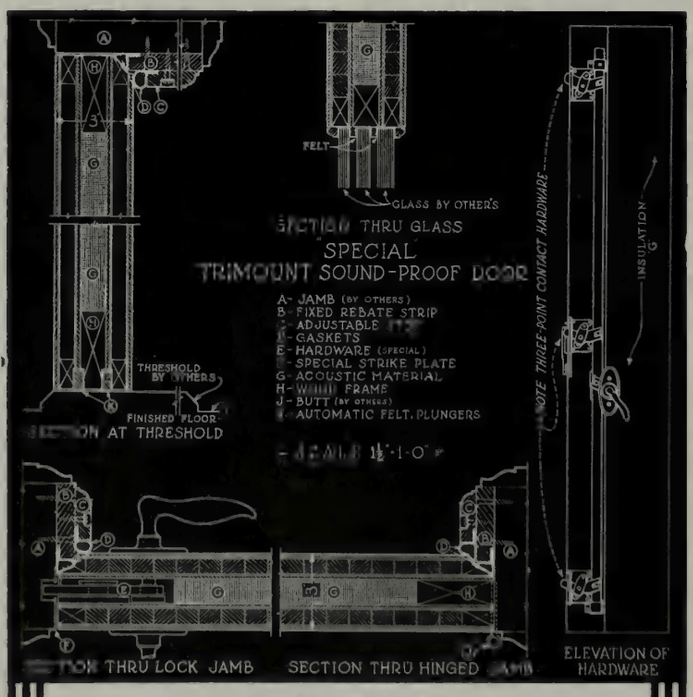
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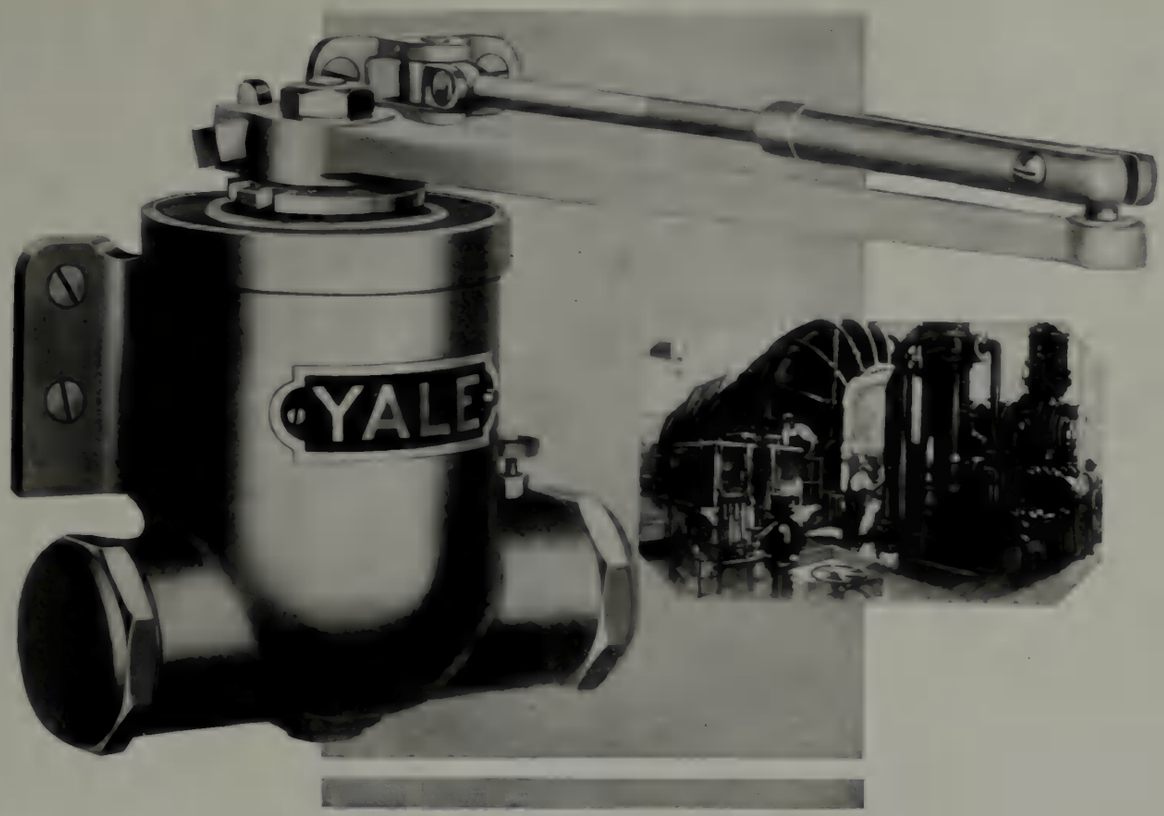
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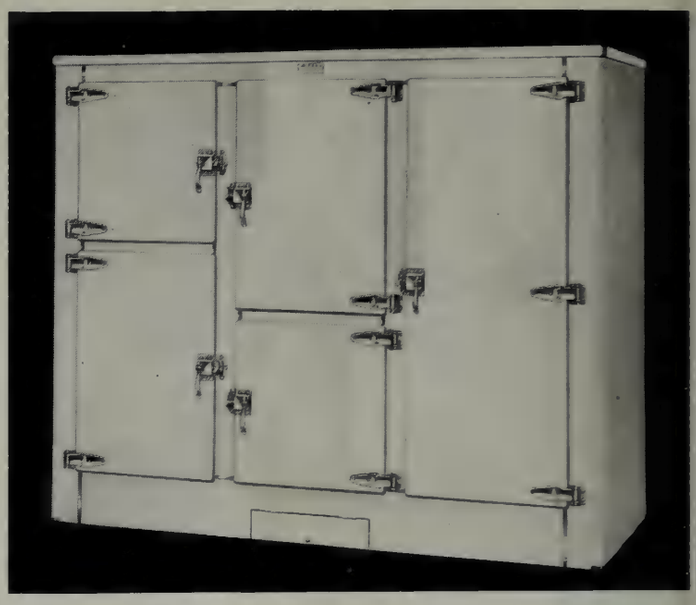
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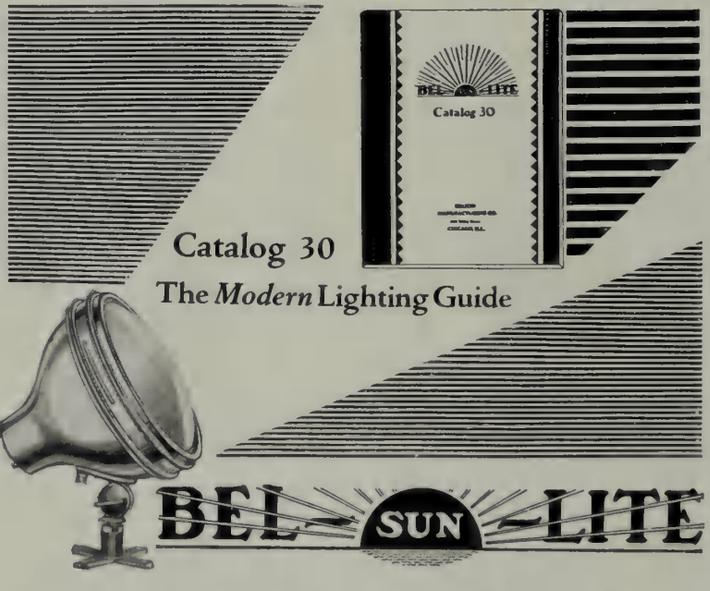


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Catalog 30

The *Modern* Lighting Guide

BEL-SUN-LITE

Theatre, salesroom, playground and spectacular lighting have made long strides since any firm last published a catalog. Bel-Sun-Lites have kept pace, as this new handbook shows. You, too, should keep pace. Have at hand the newest developments in illumination. By sending the coupon you may have them, free.

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Designing a Modern Lighting System in Harmony with Period Architecture

Methodist Episcopal Church
Hanson Place and St. Felix St.
Brooklyn, N. Y.

Architects: Halsey, McCormack & Helmer, Inc.
New York

Church lighting, under ordinary circumstances, offers many problems which require careful study. The illumination of the Methodist Episcopal Church at Hanson Place in Brooklyn, New York, presented a typically modern problem: the design of a modern lighting system in harmony with period architecture.

The architects sought a lighting scheme which would blend modern appointments with old Gothic design.

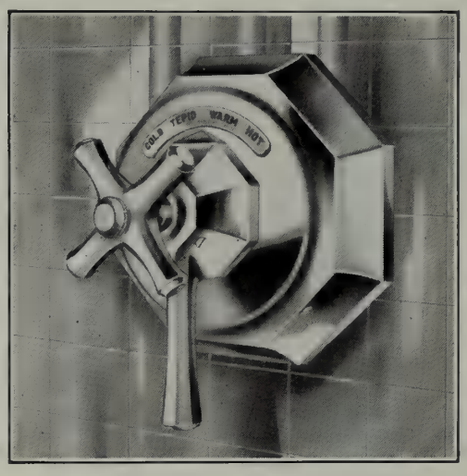
The lighting bureau of the utility supplying the electric service placed at the disposal of the architects, Halsey, McCormack and Helmer, the entire facilities of their department. The bureau made helpful suggestions regarding the location of outlets, the selection of luminaires, recessed reflectors and ceiling panels.

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For information about trends in lighting standards and about adequate wiring, call on the lighting bureau of your local electric service company, or write direct.

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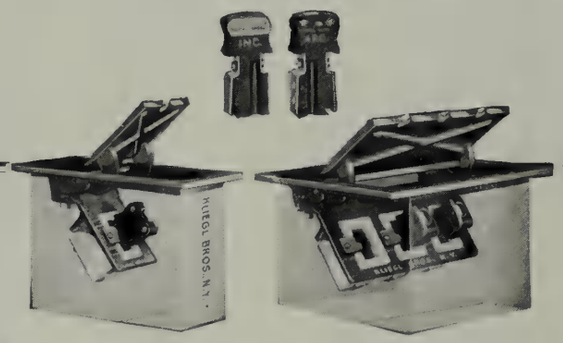
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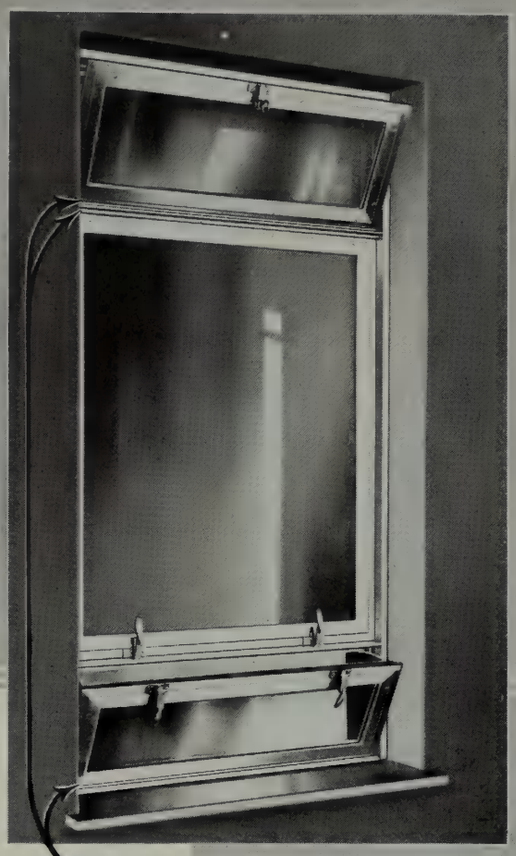
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Alphabetical Index to Advertisers, Page 184

After reviewing advertisements in this issue—use Sweet's Architectural Catalogues for 1930 for catalogue and specification information on the products of the most of the manufacturers.

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Knight, Maurice A.

Acoustical Installation—Armstrong Cork & Insulation Co.
Guastavino, R., Co.

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Johns-Manville Corp.
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Aluminum Co. of America

Anchors—Concrete
Bulldog Floor Clip Co.

Arc Welding—Lincoln Electric Co.

Architectural Supplies
Higgins, Chas. M., & Co.

Artstone—Rackle, George, & Sons Co.

Asbestos—Johns-Manville Corporation

Balances, Sash—See Sash Balances

Basement, Windows—Steel
Detroit Steel Products Co.
Truscon Steel Company

Bathroom Accessories
Parker Charles Company

Beads—Corner Metal
Milcor Steel Co.
Truscon Steel Company
Wheeling Corrugating Co.

Beams, Angles, Channels, Etc.
Bethlehem Steel Co.
Carnegie Steel Company
Jones & Laughlin Steel Corp.

Belts—Dayton Rubber Mfg. Co.

Blackboards—Weber Costello Co.

Boiler and Pipe Covering
Johns-Manville Corporation
Ric-wiL Company

Boilers—American Gas Products Co.
American Radiator Co.
Bryan Steam Corp.
Dahlquist Mfg. Co.
Heggie-Simplex Boiler Co.
Pierce, Butler & Pierce Mfg. Co.
Smith, H. B., Company, The, Inc.
Titusville Iron Work Co.
Wood Gar Engineering Co.

Bolts—Door—Corbin, P. & F.

Brass and Bronze
See "Ornamental Metal"

Brass and Copper
See "Copper and Brass"

Brick—Finzer Bros. Clay Co.

Bridges—Steel—American Bridge Co.
Bethlehem Steel Co.

Building Paper
Natural Steel Fabric Co.

Buildings—Steel
Carnegie Steel Company
Nat'l Assoc. of Flat Rolled Steel Mfrs.

Butts—Corbin, P. & F.
Stanley Works

Cabinet Work—Hyde-Murphy Co.

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Olean Metal Cabinet Works, Inc.

Cabinets—Medicine—Parker Charles Company

Cabinets—Toilet Paper
Victoria Paper Mills Co.

Casement Operators—Rixson, Oscar C., Company

Casements—Bayley, William, Co.
Crittall Casement Window Co.
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Cast Stone
Cast Stone Institute

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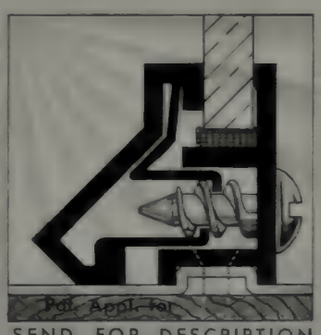




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HEALTH drinks for the multitudes every day in the year. Sparkling water, clean and convenient from modern Century Fountains. Flowing health with each turn of the handle. The unique Century invention is a boon to sanitation. It completely conquers fluctuating water pressure and assures at all times a full, wholesome drinking stream. The bubblerhead is so constructed that no waste from the drinker's mouth can fall back on the source of the water. All mechanical devices to promote health have been incorporated.



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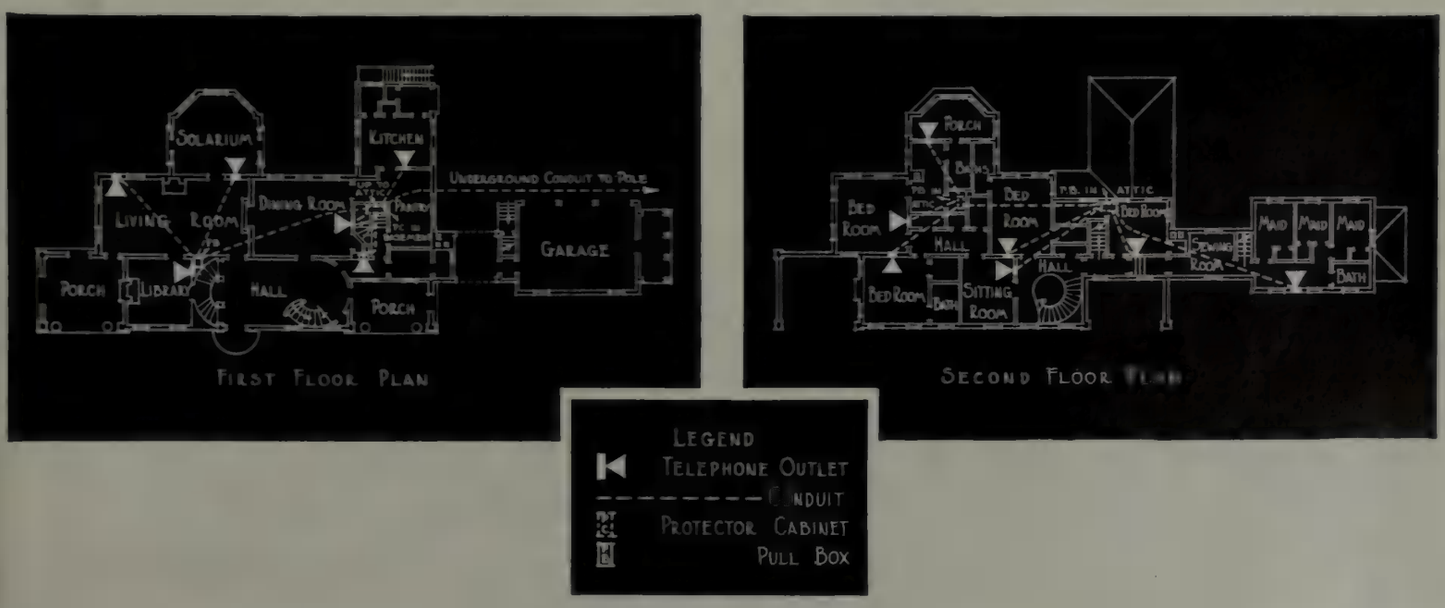
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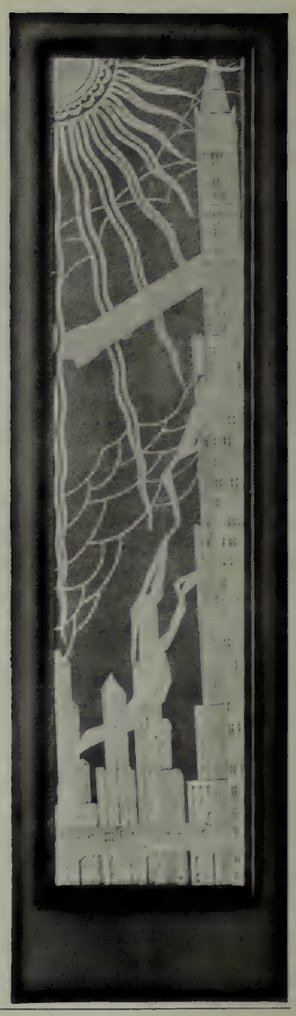
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HARDWARE...

LOCKS...

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LOCKS AND HARDWARE



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Genuine Dubois is branded on the back of every 5-foot section, for the protection of your clients. Only selected *live-cut* French chestnut is used for Dubois. The wood is weathered for years and kiln-dried, before being used. This is why Dubois never warps and withstands 30 years of exposure without the need of paint or any other upkeep expense. Specify Dubois *by name.*

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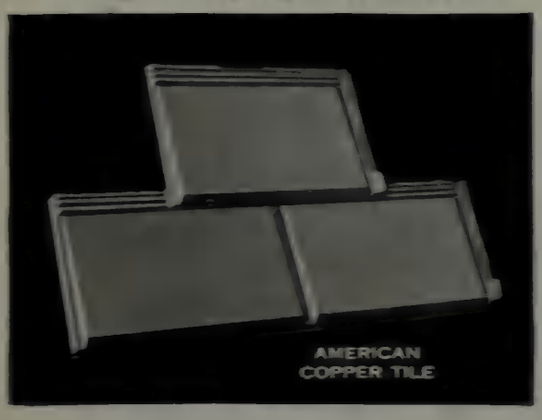
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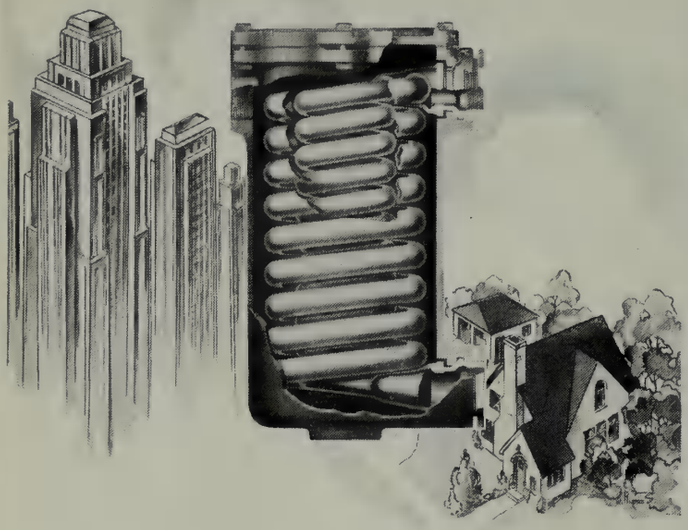
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Norton Door Closer Co. 157 ◈
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Oak Flooring Mfrs. Assoc. of U. S. 177 ◈
O'Brien Bros. Slate Co., Inc. 80 ◈
Olean Metal Cabinet Works, Inc. 142
Ortho-Tone Co. 166
Otis Elevator Co. 62 ◈

Paramount Water Softener. 156
Pardee, C. Wks. 103 ◈
Pearlman, Victor S., & Company. 96
Peelle Company, The. 72 ◈
Peerless Unit Ventilation Co., Inc. 133 ◈
Penberthy Injector Co. 95 ◈
Pittsburgh Plate Glass Co. 34–111 ◈
Port Orford Cedar Products Co. 42
Portland Cement Assn. 65 ◈
Pratt & Lambert, Inc. 31 ◈
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Pyrene Mfg. Co., Inc. 160 ◈

R.C.A. Victor Co., Inc. 98 ◈
Rackle, Geo., & Sons Co., The. 176 ◈
Raymond Concrete Pile Co. 7 ◈
Reading Iron Co. 110 ◈
Reeves, Robert C., Co. 158 ◈
Ric-wiL Co. 178 ◈
Rising & Nelson Slate Co. 26 ◈
Rixson, Oscar C., Company. 135 ◈
Robertson Art Tile Co. 37 ◈
Rolscreen Co. 32 ◈
Rundle-Spence Mfg. Co. 138
Russell & Erwin Mfg. Co. 105 ◈

Samson Cordage Works. 164 ◈
Sanymetal Products Co. 12 ◈
Sargent & Co. 173
Security Fire Door Co. 179 ◈
Sheldon, F. C., Slate Co. 21 ◈
Silver Lake Co. 156 ◈
Smith, H. B., Co. 85 ◈
Smith & Egge Mfg. Co. 156 ◈
Smith & Wesson. 126
Snead & Co. 59 ◈
Sonneborn, L., Sons, Inc. 183 ◈
Soss Mfg. Co. 166 ◈
Southern Cypress Mfrs. Assn. 10
Spang, Chalfant & Co., Inc. 33 ◈
Spencer Turbine Co. 185 ◈
Stanley Works, The. 15 ◈
Structural Gypsum Corp. 90 ◈
Sturtevant, B. F., Co. 129 ◈
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Taylor, Hasley W., Co. 50 ◈
Thompson Mfg. Co. 180 ◈
Thorp Fire Proof Door Co. 4th Cover ◈
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Trenton Potteries Co. 123
Trumbull Elec. Mfg. Co. 137 ◈
Truscon Laboratories. 2 ◈
Truscon Steel Co. 8–9 ◈

Union Metal Mfg. Co. 106 ◈
United Metal Products Co. 172 ◈
U. S. Gutta Percha Paint Co. 91 ◈
U. S. Gypsum Co. 23 ◈
U. S. Mineral Wool Co. 142 ◈
Universal Atlas Cement Co. 2nd Cover ◈

Ventilouvre Co. 148 ◈
Vermont Marble Co. 158 ◈
Victor Oolitic Stone Company. 107 ◈
Vitrolite Co. 4 ◈
Vortex Mfg. Co. 134 ◈

Weis, Henry Mfg. Co. 16 ◈
Westco-Chippewa Pump Co. 154 ◈
Western Pine Mfrs. Assoc. 66 ◈
Westinghouse Electric Elevator Co. 57 ◈
Wickwire-Spencer Steel Co. 136 ◈
Williams Pivot Sash Co. 132 ◈
Wilson, J. G. Corp. 64 ◈
Wood, Gar, Engineering Co. 63
Wright Rubber Products Co. 162 ◈

Yale & Towne Mfg. Co. 161 ◈
Youngstown Sheet & Tube Co. 113 ◈

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